

BECKER (J.W.)

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Becker (G. W.) 15.

LETTER,

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Berlin, November 5th, 1881.

MY DEAR SIR,

HAVING been asked by you, as well as by some of my medical friends in England, to communicate the results of the inquiries made on the Continent of Europe, and particularly in the city of Berlin, respecting the Indian cholera, I have collected some materials which I think will prove interesting to you; and I have thought that there might, at the same time, be some advantage in my making known to the British public what is the present state of our knowledge of this singular and awful disease. In affording this information, it seems to me that continental medicine is but acquitting a debt which it owes to British science in return for the first accounts transmitted by British practitioners in India of the nature and treatment of cholera. It would, indeed, be highly unjust not to acknowledge how much we owe to the zeal in observing, and to the accuracy in describing, the disease, which the Indian medical men have shewn*. The cholera, however, having now crossed the immense continent of Asia and Europe, and having finally reached the shores of the German Ocean, threatening an invasion of the British islands, a statement founded on its appearance in this part of Europe needs no apology, particularly if it should tend to modify to some extent the views entertained with regard to the disease by the majority of those who have observed it in India.

I shall in this letter confine myself to a consideration of the

* A most valuable mass of information is contained in the Reports drawn up under the superintendence of the Medical Boards of the three Presidencies, not to mention numerous other works, which have been published in India and England. I take this opportunity to express my obligations to John Petty Muspratt, esq., one of the Directors of the Honourable East India Company; and to my friend Dr. Somerville, Physician to the Royal Hospital, Chelsea, through whose kindness I have been put in possession of some of these very scarce books.

causes of the malignant cholera, and of the means of preventing that disease. I propose to reserve for a future occasion the remarks which I have to offer to my English friends on the symptoms, pathology, and treatment of cholera.

In the investigation of the causes of cholera peculiar difficulties have, since the appearance of the disease in Europe, arisen from the influence exercised over this purely medical question by commercial and political interests; for the attention of medical men, as well as of the public at large, has been, in a great measure, absorbed by discussions as to the propriety of certain preventive measures, which most of the European governments have adopted in order to arrest the march of the disease; and the animosity with which these discussions are carried on has materially prevented the progress of a calm scientific inquiry.

After an impartial examination of the progress of cholera in Asia and Europe, and more particularly in Prussia, and after the observation of numerous cases in the city of Berlin, I feel no hesitation in expressing my full conviction that the disease is, in these climates at least, propagated and produced solely by a *peculiar human effluvia*, and, therefore, undoubtedly deserves the denomination of a *contagious disease**.

It appears to me that it will be well in this inquiry to *waive*

* Some English as well as French authors have laid down a distinction between *contagious* and *infectious* diseases, restricting the word *contagion* to those cases in which the communication of a disease takes place, evidently and exclusively, by actual contact, while they employ the term *infection* to express that propagation of disease which is caused by human effluvia, without actual contact, and by means of an impure atmosphere. The different modes by which the virus produced in a disease is directly or indirectly communicated to another person in whom it causes the same disease, form one of the most obscure problems in medical theory, the solution of which is by no means advanced by artificial distinctions like the above. We accordingly employ the words *contagion* and *human effluvia* as synonymous and general terms, expressing that agent which, generated by the animal economy in a state of disease, may, by its direct or indirect communication to another person, produce in him the same form of disease under which the former person laboured; and we call *contagious* the diseases in which these contagions or effluvia are generated. Contagion is thus distinguished, on the one hand, from the efficient cause of purely endemic and epidemic diseases (marsh-miasma, influenza, &c.); and, on the other hand, from those morbid causes which are generated in animal bodies, but do not propagate one and the same disease, such as the poison of insects, of serpents, and of rabid dogs; the effluvia from very crowded assemblies (like those of the well known Black-hole of Calcutta); the virus taken in from dead bodies in dissecting, and the emanations from the common-sewers, churchyards, and other decomposed animal remains. To several of these agents the name of *infection* is sometimes given, and it would perhaps be desirable to restrict it to them exclusively.

altogether the question of the first origin of the malignant cholera. The adversaries of contagion in this country, generally, urge, as one of their principal arguments, that whatever mode of propagation may be assumed, the cholera must somewhere have had a beginning, that it must at one time have been produced by the ordinary exciting causes of disease; and that, *therefore*, these causes must at present also be regarded as sufficient to produce the cholera, without the agency of contagion. Our contagionists, on the other hand, to meet this argument, have thought it necessary to account for the original generation of the disease, and they have accordingly constructed a variety of physical and hyperphysical hypotheses, each of them abundantly showing why the malignant cholera must necessarily have taken its origin on the banks of the Ganges. India being very far off, these speculators have found no difficulty in making gratuitous assumptions as to the existence of such peculiarities of the climate, soil, and habits of the natives of that country, as were convenient for their fanciful theories of the origin of cholera. We can only say, that of its first origin we know nothing; nor does it seem to be a more legitimate subject of medical inquiry than the primary cause of small-pox or of syphilis, diseases which must likewise, at some period, have had a beginning, but which are now known to be propagated only by contagion. I return accordingly to the causes of cholera, such as they have been known to act since this disease has advanced into the countries of the European continent.

It is the subject of common observation, that most persons who are seized with cholera have, shortly before the attack, been subject to some one of the common causes of disease,—viz., cold, fatigue, anxiety of mind, but particularly the immoderate use of obnoxious articles of food or drink. These facts have led some persons to believe that the cholera may actually be produced by the sole agency of the above various causes. Such a doctrine, however, is scarcely deserving of refutation; for how can a disease, so peculiar in its symptoms, in its termination, and in its effects on the structure of the body, a disease which only prevails in certain places, and at certain times, be seriously considered as essentially produced by a variety of causes, the ordinary effects of which are well known, but changeable, and to which mankind is subject at all times, and in all places?

All principles of medical theory force us to conclude that the malignant cholera, being an eminently *specific disease*, must be owing to some *specific cause*, to an agent of a peculiar kind, to which the animal economy is subject only in those places and

at those times at which the cholera prevails, and without the presence of which none of the ordinary causes of disease will be followed by that very singular concurrence of symptoms. A difference of opinion can exist only as to the nature of this cause and the laws of its action: and the point of investigation is, especially, whether the essential cause of cholera depends on some general or atmospheric influence, *miasma*, or other unknown agency, extending itself over certain districts of country, according to peculiar laws, with the nature of which we are but imperfectly acquainted,—or whether there is sufficient evidence for believing it to be merely a production of the human body in a state of disease,—a *contagious effluvium*,—and also for considering the disease as transmitted from one country to another solely by human intercourse. The adoption of either of these doctrines supposes the admission of a *disposition* to the disease on the part of those who are attacked with it, an admission which is even more necessary to account for the phenomena of endemic and epidemic diseases, than for the propagation of human contagion: for, if a peculiar disposition was not required in order to be attacked, all persons whatever, who live under an endemic or epidemic influence, would be attacked by it; all inhabitants of a marshy country would have intermittent fevers, &c. I shall afterwards return to the consideration of this disposition, and have in this place only to advert to the inconsistency of the non-contagionists, who call in question the propriety of regarding the usual causes of disease merely as *auxiliary* agents, or as *predisposing* to the production of cholera, believing this doctrine to be peculiar to the contagionists, whereas it is quite as necessary in order to account for the disease according to the theory of an epidemic influence.

The opinion that the malignant cholera is in these climates solely produced by a contagious effluvium derives its weight chiefly from the following arguments:—

I. The *extension of this disease through the different countries* of Asia and Europe. Much has been said of the uniform march of cholera from east to west, or, as some will have it, from south-east to north-west, and it has been attempted to draw an analogy between the progress of this disease and that of the epidemic influenzas which have so often attracted the attention of medical men. Those, however, who are at all familiar with the directions which the cholera has taken, are aware how little foundation there is for hypotheses of this description. After having prevailed in India, the cholera has spread to the east as well as to the west, to China as well as

to Persia, nor has there been even in its western march any sort of regularity or uniformity. The cholera pays no attention to longitude and latitude, it heeds neither heat nor cold, neither high nor low situation, neither hills nor valleys, seas nor rivers, any further than in as far as these circumstances influence that *one* cause, which seems to direct all its motions, viz., the more or less lively intercourse of men. The disease uniformly follows this intercourse, whether it take place by land or by water, by impetuous armies, slow caravans, or poor pedlars, by ships or small fishing-boats. Wherever this intercourse exists, and in its neighbourhood, the cholera may appear, and extend its ravages, while it frequently leaves unmolested large districts, which in every respect resemble the country affected by the disease, except in affording no opportunities for frequent intercourse. It is very natural that when this singular law in the distribution of cholera was supported only by accounts received from countries with the topography and medical history of which we are but imperfectly acquainted, it was looked upon with diffidence, and doubts were entertained as to the authenticity of the facts produced: but as we now see the same phenomenon taking place, as it were, under our own eyes; as we can trace the disease from one village to another, and point out not only the districts which suffer from it, but those in the immediate neighbourhood which it has not touched, we can no longer refuse our assent to the force of an argument which of itself would be sufficient to establish the doctrine that cholera is solely produced by human effluvia.

It would be foreign to my purpose to detail the progress of the malignant cholera in Asia, which must be well known to you, and is fully described in the report which *M. Moreau de Jonnès* has addressed to the French Board of Health. But I have, in the Appendix, collected some materials which exhibit the march of the disease through Russia into Poland, Prussia, and the neighbouring countries. I should wish you to peruse these statements attentively, and with the assistance of a map, and I have no doubt that you will be struck with the results of this inquiry. I shall here only sum up the most important facts connected with this part of the march of cholera:—

- i. Its repeated appearance in Russia in 1829, 1830, and in 1831; its importation into the different towns on the river Wolga; the immunity of Sarepta and Simbirk, where strict preventive measures had been taken; the re-appearance of the disease at Nishney Nowgorod, and its transmission to Kasan, which in 1829 had remained free; the northern progress of the cholera, and the immunity of St. Petersburg in 1830.

ii. The evident importation of the cholera into the kingdom of Poland by the Russian army.

iii. The period of time during which the progress of the disease was arrested on the frontiers of Prussia, while military lines and quarantines were established; the irregular manner in which the disease broke through those lines, and the remarkable immunity which the province of Silesia enjoyed for a series of months.

iv. The successive appearance of cholera at Riga on the 20th of May, 1831, and at Dantzic on the 27th of the same month, whereas it did not reach the *intermediate* sea-port towns, Elbing, Königsberg, and Memel, till the 11th, 22d, and 28th of July, an order quite irreconcilable with all notions of epidemic influence—the prevalence of the disease thus propagated along the shores of the Baltic, and at the same time along the frontiers of Poland, whilst the interior of the country (East Prussia) remained perfectly free from it.

v. The descent of cholera along the river Warthe from the frontiers of Poland to the Oder; its transmission along the Oder to Stettin and the surrounding villages, and its march from the same river to Berlin by the very circuitous route of the Fienow canal and Havel. The direction of the disease in this part of the country has shown, beyond all doubt, that navigation was the sole channel through which it was transmitted; and very naturally so, because all other modes of travelling were at the time under strict control. The whole surrounding country, the interior of the province of Pomerania, and the districts to the north as well as to the south of the river Warthe, remained unmolested, although it cannot be imagined that any peculiarity in their site could have protected them, situated as they are, low and marshy, and surrounded on all sides by lakes and rivulets. Not only the villages on the direct road from the Oder to Berlin, but even those which lie in the immediate vicinity of that river, surrounded by water, but not frequented by the shipping, have had no cholera. It is impossible to predict, however, whether the disease will not now, having found a central situation in Berlin, be transmitted to the environs by other channels of communication.

II. The manner in which the cholera is observed to *spread in those towns in which it appears*. In seaports and towns situated on navigable rivers in which the cholera has appeared, it has been, as far as my knowledge goes, almost uniformly observed, that the first cases of this disease have occurred in boats and in houses situated in the neighbourhood of the water. Some have been inclined to consider the exhalations

from the surface of the water, and the dampness of the houses caused by the vicinity of the water, as a sufficient ground for the predilection which the cholera thus seems to entertain for that element; but whilst it may be admitted, that the cold to which skippers, fishermen, and the inhabitants of houses near rivers and canals are frequently exposed, renders them, in some degree, more susceptible to cholera than other persons; the fact that the cholera has in towns, as in the country, sought only *navigable* portions of water, and not been influenced by other damp situations, lakes, ditches, &c., undoubtedly leads to the conclusion, that in both cases not *the water* itself, but the facility of intercourse *by water* must be regarded as the circumstance essential in the production of the disease.

That the transmission of cholera in general, and its introduction into particular towns, should in so large a proportion of instances be owing to navigation, is a very interesting fact: but it must appear a very natural one, when it is remembered that no other mode of communication affords the same facility for the transport of sick persons; that the close cabins of boats and ships are almost the only vehicle in which the effluvia of this disease can be carried a considerable distance, and that it is scarcely possible to control river-navigation by the preventive measures by which some governments have attempted to check the progress of the disease. Add to this the unwholesome manner of living of skippers and fishermen, their constant exposure to the vicissitudes of temperature, their neglect of all medical treatment, and the propagation of the cholera among this class of persons, and through them to other individuals who associate with them, cannot excite any surprise.

The *original* seat of cholera, generally, is the river-side; but it by no means limits itself to this district; nor does it from thence gradually and uniformly extend to the neighbouring, and then to the more distant, parts of a town; nor does it exclusively adhere to low and damp situations. After a short time it *leaps*, as it were, to more or less remote streets and houses; in some of these it occurs in solitary instances, in others it extends: the latter case generally happens in narrow, populous streets, in close, airless, dark, and crowded habitations, among a poor, ill-fed, ill-clothed population,—in short, in circumstances, all of which are known to be the usual concomitants of other contagious diseases, such as typhus, small-pox, and measles.

You will in the Appendix find ample proofs for the truth of this statement, derived from the history of cholera in the

Russian and Prussian towns, where it selected its victims in situations, to account for which completely baffled the ingenuity of the searchers for miasma. The most abundant evidence, however, of the progress of cholera, according to the principle now stated, is afforded by the city of Berlin, from the slow and gradual manner in which it reached and occupied different districts of that capital. With the assistance of a map of Berlin, on which every house reported as infected has been marked, and of other very satisfactory notes, I am able to give you the following authentic details of the progress of cholera in this city:—

i. The disease having evidently been imported by the navigation on the Fienow canal and Havel, one skipper coming from an infected district having died in his boat at Charlottenburg on the 29th of August, and another also in his boat at Berlin on the 30th, various other cases now occurred in the *boats*, and in the *streets in the immediate neighbourhood of the navigated part of the river*, inhabited by persons who had intercourse with the shipping. These streets extend through the whole breadth of the town, and part of them form one of the most populous districts. On all parts of this line cases of cholera occurred on the 31st of August, 1st, 2d, and 3d of September, and the following days; and in some of these streets the disease committed great ravages. Thus on the *Schiffbauerdamm*, a quay in an open situation, where the boats loaded with wood are unloaded, six cases are reported in the month of September in boats, and twenty-six cases in ten out of the twenty-eight houses forming the street. Higher up, in the district where the sale of fish and fruit goes on, we find on each side of the river a row of houses: one of them, on the north-east side (*Schleuse*), consists of shops and small habitations of the lower classes. No. 4 of this row had the first cholera case which occurred in *any* house in Berlin, and the disease successively showed itself in the houses 2, 5, 11, 12, 14, and 15, in which twelve cases are *reported* (I know the real number to have been greater) within twenty days: no new case having been recorded after the 19th of September for several weeks. The row on the opposite side (*Wasserstrasse*), well known to be cold and damp, but occupied by inhabitants who have no intercourse with the skippers, remained without a single case of cholera; but the disease spread considerably to several small streets and alleys situated *behind* this *Wasserstrasse*, and consequently at a greater distance from the river, but occupied by the lower orders. The continuation of the *Schleuse* is the *Friedrichsgracht*, which, extending in the shape of an inverted crescent, is, along with the *Fischerbrücke*, surrounded by the

river, here filled with fishing-boats and other small craft, and wells for fish. These and the neighbouring streets, *Fischerstrasse*, *Petristrasse*, *Ross-strasse*, *Mühlendamm*, were also from the very first days infected by the cholera: the whole district is thickly inhabited, chiefly by persons of the lower classes, whose business leads them to frequent intercourse with the river. Up to the 1st of October I find forty-eight houses in this district marked as having had seventy-three cholera patients.

ii. The cholera was not observed in any other part of the city of Berlin for four days after it had shown itself in the districts now mentioned, which is the more deserving of attention, as various other parts are situated equally low, and intersected by canals of the river Spree, but not navigated.

iii. The first case which occurred at a distance from the river (No. 16 of the cholera list) was that of a person who had worked at the Mint (close to the river, and opposite to the *Schleuse*), and who was seized on the 3d of September, at his house in the *Kaiserstrasse*, a dry, airy, elevated street in the eastern suburbs. Between the 3d and 22d of September five other cases of cholera were reported from three different houses of this same street.

iv. The second case reported from a situation removed from the river happened on the same day (September 3d), in the *Workhouse*, a large building, containing about 700 inhabitants of the lowest classes, who there find employment. During the month of September fifty-seven persons were taken ill of cholera in this house. Another building situated close to the *Workhouse*, inhabited by about 550 persons of the same description, had thirty-six patients, the first of whom, however, was not reported till September 8th, *five days after the appearance of the disease in the neighbouring Workhouse*: the two buildings being exposed to precisely the same atmospheric and terrestrial influences, and the mode of living of the inhabitants being also identical.

v. The disease now successively showed itself in other districts, particularly in many of the close streets in the central parts of the city, and in those streets in the northern and eastern suburbs, which are chiefly inhabited by labourers. It was long in reaching some of these districts, but having once appeared, extended in them with as great intensity as in the neighbourhood of the river.

Thus in the fifty-eighth district*, which is *extra muros*, and

* The city and suburbs have been divided into sixty-one districts, in each of which a committee, consisting of respectable inhabitants and

at a great distance from the river, but inhabited by labourers, Dr. Oppert observed the first case of cholera on the 10th of September, *the disease having then been twelve days in Berlin*. The patient died on the 14th, on which day his landlord, who had shaved him during his illness, and a woman who lived next door to him, were taken ill, and also died. Three days afterwards a fourth person died in the same house; and *seven houses in the same street* were now successively attacked.

The fifty-ninth district includes four large houses, in which between 2000 and 3000 inhabitants, the most wretched population of Berlin, live, crowded together in a deplorable manner, sometimes several families in one room. These houses (commonly called *family-houses*), built by an avaricious speculator, are universally considered as our greatest general nuisance. On this occasion some curiosity was entertained how the cholera would treat them. Those who ascribe the disease to the influence of the river, expected them to remain free, because they are far from the water;—those who seek the miasma in the air, and believe it to act on those who are exposed to cold, want, and intemperance, presumed that these houses were to suffer immediately. Neither expectation was fulfilled: the *family-houses remained free of cholera for three weeks*; but between the 21st of September and the 15th of October, *between forty and fifty cases* occurred in them. In *ten rooms* more than one case happened; and according to the report of the physician of the district, Dr. Thümmel, these recurrences were almost exclusively found, where the first case was not removed till dead, or dying. The comparatively small total number of cholera cases in this very unfavourable situation is in great part to be ascribed to the activity of the gentleman just named, who caused the patients to be removed, as soon as notice was given, to an appropriate hospital.

vi. Other districts have remained remarkably free of cholera down to the present day. Thus the streets near the Hallegate, which lie in the neighbourhood of a canal, and so low, that the cellars are every winter filled with water, have scarcely had any disease. One of these streets (Wilhelmstrasse) is in part inhabited by very poor weavers, whose dwellings can by no means be regarded as healthy; still they have not suffered from cholera. But they live far from the river, and their secluded mode of life does not lead them to mix with the inhabitants of the infected districts.

vii. In the greater part of the west-end of the town (Fried-

medical men, is appointed to superintend the measures for the prevention and cure of cholera.

richstadt), solitary cases of cholera have occurred, principally in the few houses occupied by the poor, in this district, which is chiefly inhabited by the better classes. In many instances it has been easy to trace the origin of these cases to communications which the patients had had with the infected districts, particularly with the shipping.

viii. The district of the committee of which I am a member (No. 13), comprehending 5000 inhabitants, in what may be termed the best part of the town, has, till now, been, above all others, fortunate in having little cholera. From September 4th to November 4th, only *six* cases occurred in private houses, and *five among the attendants* of an institution founded for the relief of the patients of this district. It is a remarkable fact that, this institution occupying two small houses, Kanonierstrasse, 33 and 34, two out of the above six cases occurred in the same street, Nos. 32 and 35, the contiguous houses; one of the patients being a lodger of the nurse of the institution.

III. The *recurrence of cholera* in the houses in which it has once appeared. Upon this subject different reports have been given from various quarters. There is no doubt that, in the majority of instances, a case of cholera having occurred, no other person takes the disease in the same house, and this from several causes, viz., the speedy removal of the patient to an hospital; the care taken by the other inhabitants of the house not only to avoid infection, but to live in a manner which does not produce a disposition; and, above all, the small proportion of individuals who are, under all circumstances, susceptible to take the disease even when exposed to the contagion. If, therefore, the cholera does *not* recur in a house, this certainly cannot be regarded as an argument against contagion in general. If, on the other hand, it is observed to recur in a considerable number of instances, the number of cholera patients being altogether small in proportion to the total number of inhabitants of a town, a suspicion arises that this phenomenon is not owing to *chance*.

I shall first communicate to you the results of the Königsberg lists; and I cannot but express my surprise that it should have fallen to the lot of a medical man of Berlin (Professor Wagner) to deduce these facts from the catalogue of cases in the Königsberg *Cholera Gazette*—the physicians of that place, who are staunch anti-contagionists, having taken good care not to direct the public attention to facts which so decidedly militate against their doctrine.

From July 22d to September 21st, 1831, 1451 cases of cholera are reported in Königsberg, a city of 60,000 inha-

bitants ; nearly $2\frac{1}{2}$ per cent. consequently laboured under the disease.

Of these	21	persons	were taken	ill in	one house	.	21
	10	"	in each of	"	two houses	. (2 × 10) =	20
	9	"	in each of	"	two houses	. (2 × 9) =	18
	8	"	in each of	"	seven houses	. (7 × 8) =	56
	7	"	in	"	one house	.	7
	6	"	in each of	"	two houses	. (2 × 6) =	12
	5	"	in each of	"	three houses	. (3 × 5) =	15
	4	"	in each of	"	ten houses	. (10 × 4) =	40
	3	"	in each of	"	fourteen houses	. (14 × 3) =	42
	2	"	in each of	"	nine houses	. (9 × 2) =	18
							249

The space of time which elapsed in these instances between one case of cholera and the next case in the same house was—

one day in	59	cases	twelve days in	3	cases
two days	27		thirteen	1	
three	16		fourteen	2	
four	18		fifteen	1	
five	7		sixteen	1	
six	9		eighteen	3	
seven	12		twenty	4	
eight	3		twenty-one	1	
nine	2		twenty-three	1	
ten	3		twenty-six	1	
eleven	4		twenty-eight	1	

If, in the latter part of these cases, the intermediate time appears too long to allow of a transmission of contagion from one person to another, a new infection may be admitted in some of them: in others, however, we may consider the *intermediate occurrence* of cases, which were so mild as not to be officially announced, as very probable, for there is every reason to believe that some of the mildest cases, where only diarrhœa and vomiting are remarked, may again produce intense cholera.

I cannot yet transmit to you a full view of the recurrence of cholera in the same houses, in the city of Berlin. The following, however, comprehends those cases which were *reported* from the commencement of the disease (August 31st), to the 26th of September:—

Total number of cholera cases 770
(twenty-nine of which were found in boats, and in the street).

A second case happened in the same house—

after one day	65	times	after six days	7	times
two days	34		seven days	3	
three days	23		eight days	2	
four days	16		nine days	0	
five days	11				

I know this number to be far below the truth, because in very many instances the first, or even successive cases of cholera in one house were not officially reported. I understand the proportion of recurrences to have grown much larger since the period to which the above calculation extends.

IV. The very frequent instances in which the disease, being evidently carried by one person to a town, village, street, or house, in which it had not till then existed, soon afterwards attacks other individuals who have had direct or indirect intercourse with that person. The adversaries of the doctrine of contagion object to the mere fact of the recurrence of cholera in the same street or house, as an argument, by supposing that the 'epidemic influence' acts at one and the same time, or successively, upon several inhabitants of the same street or house. This explanation, however, must be given up, when the arrival of a person who has caught the disease from an infected place in another house, street, or town, till then free of the disease, is within a few days followed by the propagation of the disease in these places. Numerous instances, in which such transmission could be traced, are reported from different parts of the country. I have collected a few of them in the Appendix (No. II.), and shall here mention only some of the more remarkable ones which have happened in Berlin, and some of which have fallen under my own observation.

On the 5th of September a cholera dissection was performed in one of the streets near the river (*Schleuse*), which had been the seat of the first and numerous successive cases of the disease (see p. 8). Four young physicians present, not satisfied with the information derived from the senses of sight, touch, and smell, thought proper to ascertain the properties of the blood and contents of the intestines, by *tasting* these fluids. One of these gentlemen, Dr. C—, one of the loudest adversaries of contagion, before and since the appearance of cholera in Berlin, had for a fortnight laboured under diarrhoea, but continued his professional avocations. On the 7th, he again attended a cholera patient in the evening; on the morning of the 8th, he was attacked with cholera, and died that evening*.

* Another of the physicians, mentioned above, Dr. J—, accompanied me to Dr. C—'s sick-bed: we saw him half an hour before his death. I shall never forget the words he said, with the suppressed voice so peculiar to cholera patients: 'Ah, Dr. J—, beware! let my fate be an example to you.' Dr. J— was taken ill the evening following, not of cholera, indeed, but of a very anomalous succession of symptoms, including most of those observed in cholera, and which terminated in a very severe fever

He lived and died in a part of the city where, till then, no cholera had occurred. The landlord, with whom he lodged, who, not feeling very well, had gone out to shoot a day before, heard of the melancholy event on returning home: he was seized with cholera, and died on the second day after: two of his children were attacked and died successively; and the servant-maid was also taken ill, and sent to an hospital, where she recovered, after a very severe attack of cholera. The landlord's widow, being now the only inhabitant of the house, was removed to a quarantine-establishment. The house was purified, and no other case of cholera has happened in the same street for three weeks afterwards.

A locksmith lost two of his children by the cholera on the 23d of September. In the hope of saving his last child, till then healthy, one year old, he gave it to the charge of a female friend, living in a distant part of the town, and in a house where no cholera had existed. On the 25th, this child also was taken ill, and died within a few hours; and, on the 26th, the woman who had taken charge of it, a stout and healthy person, took the cholera, and was sent to an hospital.

On the 12th of October, a man was taken ill of cholera, and died in a small house on the Potsdam road, half a mile from the gates of Berlin. The disease had now existed six weeks, yet no case had occurred within a mile in circumference of this house; next morning a child was taken ill, and died of cholera in the same room. On the 14th, I found the father of the child labouring under slight symptoms of cholera. Having in vain endeavoured to discover the origin of the disease in a situation which had till then appeared very healthy, I accidentally ascertained that the deceased had, on the morning of the 12th, gone into town, and called upon his cousin, a man employed in carrying cholera patients to the hospital.

Some weeks ago, a case of cholera occurred in the Dragoon Guards' Hospital. A convalescent from fever, whom it was intended to dismiss very soon, was attacked with this disease. It seemed extremely difficult to account for the transmission of

of the typhoid form. I am not disposed to decide whether infection or moral causes had the greatest share in producing this affection.

Similar experiments have been performed by some French medical men at Warsaw. M. Scipion Pinel inoculated himself with the blood and intestinal contents of cholera patients, the latter of which he introduced into one of the veins of the arm. Two hours afterwards he felt sick and giddy, but recovered after copious perspiration. M. Foy breathed for half a minute the air expired by a cholera patient, and tasted the matter of the vomit. He felt indisposed on the four succeeding days, but did not take cholera. To some persons these '*tours de force*' appear the most convincing arguments for the non-contagious nature of cholera.

the contagion to this man, a patient in a military hospital, in which, and in the neighbourhood of which, there had as yet been no trace of cholera, and where every inmate was supposed to be under the most constant and strict observation. The inquiries instituted to discover the channels by which the contagion had reached this man led to no result. He was immediately removed to another hospital, appropriated to the reception of cholera patients; and it was only when he was about to take leave of the medical officer who had treated him, that, thinking himself a dying man, he confessed having found means a few days before to go secretly to the house of his mother, who had died of cholera, and to take possession of some articles she had left. The man lying in the bed next to him was also seized with cholera, and likewise recovered. No more cases have since occurred in this hospital, or in its neighbourhood.

It is unnecessary to add other cases of this description: they must occur to every medical man who observes the disease, and takes the pains to inquire into the concomitant circumstances. They would be still more numerous, if it were easy, in a large and populous city, and in the class of individuals which is most frequently attacked with cholera, to trace the various modes of intercourse to which they may have been subject.

V. The proportion of cholera among hospital attendants of various descriptions cannot but be regarded as an additional argument in favour of contagion. This proportion is very variable indeed, and sometimes even so small as to be brought forward to disprove the effect of the effluvia of cholera*; but such a difference is easily accounted for by the consideration of the other causes of the disease, which act upon the hospital attendants to a greater or less extent, and dispose them to the deleterious effects of the effluvia.

In the hospital at Thorn (West Prussia), ten attendants were taken ill during the prevalence of cholera, and seven died; at Mewe, four attendants and the grave-digger were seized; at Breslau, one of the very first cholera patients was received into the hospital of the *Fratres Misericordiae*, and three of these charitable monks were taken ill immediately afterwards.

In Berlin, the Cholera Hospital, No. 2, had ten male and female attendants, and three medical assistants: of this number, six attendants and two assistants † took the cholera

* Compare Scott's Report, p. L.

† One of these gentlemen informs me that he also tasted the intestinal contents of cholera. Six hours afterwards he felt unusual motions in his

within three weeks. Of the state of health in the Cholera Hospital, No. 1, I have received the following details from my friend, Dr. Romberg, physician to that institution :—

‘ Within the first four days after the hospital was opened, both my assistants were taken ill : one of them had diarrhœa, oppression and anxiety, and pain in the calves of his legs—he recovered quickly upon taking an emetic ; the other, having one evening taken a supper of cabbage and hot red wine, was seized with oppression, diarrhœa, and a drawing pain in the calves of the legs and in the fingers : it was found necessary to bleed him ; he also took an emetic, and recovered. The next patients were two of my nurses, both of them with confirmed cholera : one of them recovered, the other died, in a late stage of the disease with the cerebral affection so often observed. Then two men, employed in carrying patients and dead bodies, took regular cholera : of them also one recovered and one died. The following patients from the house were,—a washerwoman, who complained of violent diarrhœa, spasms of the calves, and anxiety, but recovered ; a male attendant, with regular and very severe cholera, who recovered ; and the hospital superintendent, who again had an attack of vomiting, diarrhœa, and spasms in the calves. Besides these persons, who were reported on the sick list and regularly treated, a considerable number of individuals connected with the hospital-service (35 out of a total number of 70—80) occasionally complained of diarrhœa, vomiting, and drawing pains in the extremities, but soon recovered by using good diet and simple remedies.’ I may add that Dr. Romberg himself, after having been indefatigable in his hospital-duties for many weeks, was seized with faintness, and repeated attacks of sickness, vomiting, and diarrhœa, which, however, on the fourth day of his illness, yielded to a regular attack of gout, to which he had never before been subject*.

The arguments now stated seem to me to afford the most satisfactory evidence that the efficient cause of cholera is an effluvium produced in the bodies of those who labour under this disease, and not an agent, atmospheric or terrestrial, inde-

intestines ; after the eleventh hour diarrhœa came, and continued for three days, when a smart attack of cholera supervened, he having continued to do his very fatiguing duty.

* ‘ The relations who have attended on people ill of cholera, as well as the nurses appointed in military corps for that duty, and in general those whose employment has led them to be much with the sick, have been observed in very many instances to be attacked with cholera during or shortly after their attendance.’—*Scott's Reports*, p. xlix.

pendant of human intercourse. The opinion of those, indeed, who object to the admission of all contagion or human effluvia whatever, and consequently maintain that all the facts now brought forward are either untrue, or the effect of purely accidental coincidence *, has so little probability, that I shall not dwell any longer upon its refutation. But it will be necessary to advert to two different views of the causes of cholera, which have of late been advanced, and are entertained by numerous persons in Germany. Both of them are intended to reconcile the contagionist and anti-contagionist parties; which accounts for the favourable reception they have met with, for, as is well known to you, we are a most *eclectic* nation, and there is among us a greater tendency to *explain* and to *account* for scientific facts, than critically to examine their value.

On the one hand, it is contended that the cholera has indeed been transmitted to Europe, to Prussia, to the city of Berlin, by the intercourse of men; that a human contagion is its essential cause, but that this contagion, having now been communicated to a certain number of persons, may from them extend to the atmosphere of whole streets, towns, nay whole countries, infect the atmosphere itself, and thus produce the disease in any one individual of that street, town, or country, predisposed to its action, without any direct or indirect communication with the sick. This hypothesis is untenable on physical grounds; it is contradicted by every day's experience, which shows that the atmosphere, tainted by the effluvia of cholera, is confined to the room in which the patient lies, and that it is effectually purified by the admission of fresh air; and it is moreover very unnecessary, because the occurrences which it is intended to explain, viz., the cases of cholera in which the transmission of contagion is not evident, may be accounted for with greater probability in assuming that an intercourse, direct or indirect, has taken place, but escaped observation.

On the other hand it is admitted, that the cholera may occasionally prove *contagious* or *infectious*, when the effluvia of one or of many patients are collected in confined situations; but maintained that the general march of the disease, and its

* There would be no impropriety in ascribing to accident the cases in which we trace a direct or indirect intercourse with the cholera, if the total number of cases of that disease was great in proportion to the whole population. But it will be seen from the account of the cholera in the city of Berlin (Appendix, No. III.) that the number of cases reported daily very seldom amounted to sixty, and has usually been below thirty, which is so small a fraction of a population of about 250,000, that the recurrence of the disease in the same streets and houses, its occurrence after exposure to the effluvia, and particularly its frequency among hospital attendants, cannot possibly be considered as accidental.

development in the great majority of instances, does by no means depend on those effluvia, and is to be ascribed to an epidemic influence, a miasma, 'an unknown agent,' or 'circumstance with the nature of which we are not acquainted.' This view of the causes of cholera having been very generally adopted, and being likely to find favour in Great Britain also, I think it necessary to enter into a full consideration of the argument advanced in its favour.

I. 'The peculiar march of the cholera on a great scale from east to west,' which the accurate examination of facts proves to be a fiction; and 'the dependence of this march on the course of great rivers,' which we have shown to arise from the effects of navigation, and to be far from being universal, as the high roads occasionally serve the purpose of communication just as well.

II. 'The suddenness of the appearance of the disease in a town, and of its disappearance after having prevailed a longer or shorter time,' a circumstance supposed to lead to the admission of a cause acting simultaneously on the whole population. The rapidity with which the cholera spreads in a town is very different according to the manner in which it is built, the habits of the inhabitants, particularly the more or less extensive intercourse taking place between them, and according to the measures adopted to prevent or to limit its extension. It has been most striking in those cities where accidental circumstances favoured the diffusion of the contagion, such as the fair at Nishney Nowgorod in 1830; the repeated movements of the army, and the return of the wounded and of prisoners at Warsaw; a popular disturbance, having for its object the destruction of the cholera hospitals at Petersburg. In the Prussian towns, where similar occurrences did not take place, the cholera has nowhere been found to seize upon so very great a number of persons soon after its first appearance*. A *sudden disappearance* of cholera, ascribed to the cessation of the epidemic influence which is supposed to produce the disease, is in these climates of very rare occurrence; indeed, I am not aware of any considerable town in Russia or Prussia, where the disease, after having caught hold of the population, has ever *suddenly* vanished. If, however, it should happen that the pro-

* It is remarkable, however, that Königsberg, where the mob made an absurd but brutal attack upon the medical men, has, since the beginning of the disease, always had a greater proportion of cholera cases than any other larger town in Prussia.

pagation of the disease is suddenly checked by the supervention of a cause, atmospheric, terrestrial, or moral, which is unfavourable to it, such an event cannot be brought forward in order to prove that the disease itself is produced by such a cause *. Moreover, it is well known that the plague itself, in those countries where it habitually prevails, as well as in those which it has occasionally infected, diminishes or ceases spontaneously. The same law applies to small-pox, measles, typhus, &c.

II. 'The immunity from cholera of some districts and towns, which, situated in the neighbourhood of infected districts, were *not* protected by preventive lines and quarantines: and on the other hand the inefficacy of these measures in a great number of instances where they were attempted, but proved of no avail.' *

It is true that the cholera has sometimes spared towns and districts where its prevalence was anticipated, and where no measures were taken to avert the evil. But this very appearance of inconsistency in the extension of the disease is an argument against the epidemic influence, which ought to act generally and uniformly, whereas the transmission of contagion from one place to another evidently depends on the concurrence of several accidental circumstances, such as the activity of intercourse with an infected district, the predisposition of those who happen first to come into contact with the persons who arrive from such districts, &c. †

* It has been lately reported that the cholera suddenly ceased at Warsaw after the bombardment of that city by the Russian forces: and it has been concluded that either the explosion of the gunpowder acted upon the miasma floating in the air, or that the alarm caused by this event among the inhabitants destroyed their disposition to the disease. I have no means of knowing whether any credit is to be attached to this story.

† In a paper presented by Dr. Barchewitz (sent to Russia by the Prussian Government to study the cholera) to the Swedish Government, and which has since appeared in some journals, the above argument is advanced, and it is especially said, that although 50,000 persons left Moscow during the cholera of 1830, *the disease was not communicated to the surrounding districts*. We are now informed that the cholera at that time prevailed in all the provinces in the vicinity of Moscow, and we can account for the above statement, being made by an *official observer*, only in reflecting on the extraordinary system of concealment and deception which is habitually carried on in Russia. A gentleman, on whose veracity I place full reliance, informed me, that travelling in the province of Volhynia, he inquired for the cholera, and was told by the civil authorities that it did not exist in the province: on travelling five English miles further, he found himself in the midst of the disease. These facts tend to show the reliance to be placed on the evidence given by the Russians themselves.

The inefficacy of the preventive measures (military lines, quarantines) in arresting the ultimate progress of cholera in the majority of cases, is a fact which I fully admit, but which certainly can be brought forward as an argument against the doctrine of contagion, and in favour of epidemic influence, *only by those who prefer remaining ignorant of the occurrences connected with those measures.* I am of opinion, indeed, that the dependence of the march of cholera on the sole agency of human effluvia is even more strongly corroborated by the *failure*, than by the *success* of the preventive measures. For, whereas the immunity of a country protected by such measures, is, by the non-contagionists, easily accounted for on other grounds, and can only be regarded as a negative proof, almost every instance of their failure can be traced to peculiar circumstances, which place in the strongest light the transmission of the disease from one person to another. It is observed, for instance, that the province of Silesia, which has at the head of its government a gentleman eminent for the energy of his administration, was for a series of months maintained free from cholera, whilst the disease prevailed in all districts of the neighbouring kingdom of Poland; still the fact is of a general kind, and admits of various explanations. But now we hear that the military line is broken through, that a number of villages are infected, and that the disease from them extends to other parts of the country. On inquiry we find that the district which has thus baffled the measures of government (Beuthen) is one which touches, not the kingdom of Poland, but the small state of Krakau and the Austrian province of Galicia; that it is well known to be, on that account, the chief seat of *smuggling*, the mode of communication which, next to navigation, is most of all favourable to the transmission of the disease.

IV. 'The occurrence of cholera in districts, towns, and houses, where no intercourse, direct or indirect, with the sick is known to have taken place.' The importance of this argument is naturally looked upon in a very different light by those who admit an epidemic influence, and by those who do not. The former party conclude, that because no intercourse *is known to have taken place, none has actually taken place*; while the latter maintain that, although the mode of transmission is not known, the transmission itself cannot be objected to, wherever the concomitant circumstances render it *probable*, and that our ignorance of the channels through which the contagion has been communicated, can never be a sufficient ground for a new hypothesis, which gives to the

disease two different origins, one by contagion, and one spontaneous.

Upon inquiry into the accounts given of the origin of cholera in various towns and districts of Russia and Prussia, we find that in small villages and towns the source from which the cholera has been derived, seldom fails being discovered, there being no difficulty in tracing the intercourse which takes place among a limited number of persons; in larger towns, on the other hand, it is almost universally remarked, that at the first appearance of the disease several cases of it simultaneously occur in remote situations, so that it is not possible to trace any communication between them. This circumstance accounts for the fact, that in the large cities which have been attacked by cholera, Moscow, Petersburg, Warsaw, Königsberg, Dantzic, and Vienna, the belief in the epidemic origin of cholera generally prevails* among medical men as well as in the public, while the contrary opinion is commonly entertained by those whose observation has been in the country, or small towns.

It does not appear necessary to explain, that the non-contagionists employ a very unwarrantable line of argument when they ask for satisfactory proof of contagion in *every case* of cholera which occurs; a proof indeed which, in the nature of things, is, in a great proportion of cases, absolutely impossible. I shall mention, however, some of the difficulties which frequently prevent an investigation of the mode of transmission of the cholera contagion.

i. The very volatile nature of the effluvia, which, as will afterwards be shown, may almost with certainty be regarded as transmissible by a third person, who is, and remains well, whilst he conveys the contagion from one individual to another.

ii. The accidental obscurity in which, especially at the first appearance of the cholera, many cases remain buried, in consequence of which the chain along which the propagation of the disease might be traced is interrupted. The cholera commences and continues its ravages amongst the lowest class of the population, among whom numerous casualties take place, which are not accurately noticed either by medical men or by the local authorities. It has so happened, that the two first

* I shall not inquire, in this place, in how far this belief is in large cities under the influence of the commercial interest, which, in consequence of the restrictive regulations, everywhere looks with horror upon the doctrine of contagion. I have reason to believe that the animosity of our anti-contagionist brethren will greatly abate as soon as those restrictions shall cease, which have excited an almost blind opposition against the theory that gave rise to them.

cases of the cholera which fell under my own observation, on the second and on the fourth day of the appearance of the disease in Berlin, were each of them preceded, by one day, by the death of a child in the same house and family. One of these children was reported to have died of consumption, the other of 'convulsions,' but an accurate inquiry into the symptoms during life, and the inspection of the dead bodies, left no doubt that there also the cholera had been the cause of death; yet neither of them are mentioned in the lists. How many similar cases may have occurred in Berlin, as well as in other towns, before and during the first days of the *official* existence of the disease?

iii. The intentional concealment of facts connected with the spreading of cholera on the part of those who have to expect inconvenience of various kinds, when such facts become known.

On the other hand, I am not aware of any instance in the history of cholera, in which this disease has shown itself under circumstances which rendered the transmission of human effluvia from an infected spot *impossible* or even very *improbable*. The cases usually brought forward, in order to prove the spontaneous origin of cholera, are of the following descriptions.

i. The cholera prevailing in a town seizes upon persons who are supposed to be strictly secluded from all communication with the sources of contagion. We hear of cases of cholera among prisoners, inhabitants of hospitals, patients who have not left their own house, and other persons who have lived in strict privacy. Occurrences of this kind are much talked of, but the wonder frequently ceases when the circumstances are accurately examined*. And if the transmission cannot, in all instances, be traced, a few cases, in which we are

* Thus the medical men in Dantzig laid much weight upon the fact, that a prisoner 'under lock and key,' in the criminal prison of that city, was taken ill of cholera. They thought it a very immaterial coincidence, that *three days before the serjeant on guard*, at the gate of the same prison, had been attacked with the same disease, and argued that the contagion 'could not possibly have made its way through the windows of the prison!'

Within these last weeks great alarm was caused here by the circumstance, that one of the menial servants in the Palace of Charlottenburg, at present occupied by his Majesty, was seized with cholera. It was recollected that all the inhabitants of this building had for many weeks been kept separated from the public in the most strict manner possible, in order to avoid all chance of the contagion being carried to the royal residence. The non-contagionists accordingly were triumphant in the evidence afforded by this case. It was clearly ascertained, however, that the person alluded to had found means to quit the palace at night, and visit her relations in the town of Charlottenburg.

left ignorant of the mode in which the cause may have operated, cannot be regarded as of any weight in this question.

ii. The cholera appears at sea on vessels having had no communication with the land. This fact is sometimes mentioned, although the reports made from India distinctly state the contrary*. As far as I know, only one instance of this kind is on record, being mentioned in the Prussian newspapers as having occurred on the Baltic; I may mention, however, on the authority of Dr. Lichtenstein, of Mitau, that the vessel was a smuggler, which of course had frequent intercourse with the infected coast.

iii. The cholera occurs in districts and in towns where it is not known to have been transmitted. From the account of the march of cholera given in the Appendix (Nos. I. & II.), you will see that there is no town in which the appearance of cholera cannot be accounted for by transmission. You will observe, that in all instances the disease showed itself, having some time previously attacked other towns or villages which lay on the line of communication by land or by water. The only instance, indeed, which is at all difficult of explanation, is the breaking out of cholera in Dantzic and its neighbourhood. The Dantzigers, however, have limited their inquiries into this subject to the negative proof that the disease was *not imported by sea from Riga*, which city had been infected a few days before. There has been no attempt, however, to disprove the possibility or probability of a transmission of the disease by the *Vistula navigation*. The cholera prevailed at the time on the banks of the Vistula, in the kingdom of Poland. It is singular, indeed, that navigation should have carried the contagion from the frontiers of Poland to the mouth of the Vistula in the environs of Dantzic, without any cases being noticed in the intermediate districts of Prussia, an extent of about eighty English miles. The transmission, however, must be admitted to have been *possible*, and the immunity of the intermediate country may, in some measure, be accounted for by the secrecy with which the navigation down the river must have been carried on, being contrary to the preventive regulations issued by Government.

The mode in which the cholera has been transmitted to

* 'There is no instance on record of a ship from Europe having a single case of this disease, until it had communicated with the land; but there are many examples of cholera appearing on board of ships sailing from the continent of India.'—*Scott's Report*, p. 38.

The story related by Mr. Searle, in his work on cholera, and which has found its way into the German publications, of cholera breaking out spontaneously on board of a ship, proves, on examination, to refer to cases of illness totally different from cholera.

Königsberg, the capital of East Prussia, has also remained in obscurity. It may have been carried by sea from Dantzic or Elbing, or by the river Pregel from the frontiers of Russia. The local authorities, as well as the medical men, who in this city have persisted in flatly denying the contagious nature of cholera, have indeed instituted an inquiry which has led to results altogether negative; but the evidence produced by them only consists in a refutation of certain unfounded reports which happened to prevail as to the transmission of cholera, and there is no attempt to disprove the possibility of a communication with the neighbouring infected districts by a channel which may have remained unknown.

V. 'The existence of a peculiar epidemic constitution, preceding and accompanying the prevalence of cholera, and evident—*first*, by certain physical phenomena; *secondly*, by its effects on the brute creation; and, *thirdly*, by its influence upon the great mass of the inhabitants of the district or town affected.' This argument, repeatedly brought forward, and supported by medical men, has, more than all others, influenced public opinion, and produced a very general tendency to the belief in the epidemic origin of cholera. It would certainly be of great weight, if it rested upon well ascertained facts; I think it necessary, therefore, to examine somewhat minutely the value to be attached to these facts.

No person who has studied the progress of cholera through various countries will surely maintain that its first eruption or subsequent prevalence is preceded or accompanied by any peculiar *physical phenomena*, atmospheric or terrestrial. The cholera, at this moment, prevails in Calcutta, Cairo, Orenburg, Moscow, Königsberg, Warsaw, Lemberg, Berlin, Vienna, and Hamburg, cities which have nothing in common, in point of climate or situation; and it has never been attempted to show any analogy in the thermometric, barometric, or hygrometric observations, made in these places during the prevalence of cholera. This disease is known to occupy high and low ground, to occur during the heat of summer and in the cold of winter, at Borneo, and at Archangel, in damp and in dry weather. Having arrived at this general result, we can only deplore the ignorant trifling of some medical men, who, each in the narrow sphere of their own observation, discover something unusual in the weather, sufficient to them to account for the production of cholera. In the camp of the Polish army, it was a cold night, to which a part of the troops had been exposed, immediately after the battle of Iganie; at Elbing, on the other hand, it was 'an extraordinary dryness, a thick, dry fog;' at

Vienna, 'a cold thunderstorm;' at Königsberg, however, no meteorological phenomenon is noticed; and at Berlin, the weather seems to bid defiance to all imputations whatever, for we have, with a few exceptions, enjoyed most delightful autumnal weather since the appearance of cholera. This is the more remarkable, as, about three weeks before, cold weather came on suddenly, but was followed not by cholera (which had not then reached the Oder), but by a very frequent occurrence of our endemic intermittent fever.

The stories circulated about the deleterious effects of the 'choleric constitution' upon *animals* are also gravely brought forward by some persons. Birds and fish are apparently destined, along with the human species, to suffer from this capricious poison floating in the air, and proving injurious to no other part of the creation. The fowls die in great numbers about the time when cholera appears in a town, or even two, three, or six months before (for the cholera miasma reconnoitres for some time before it comes with its main force). The sparrows disappear from the streets and roofs of the houses. Lakes, ponds, and rivers, are found full of dead fish in choleric districts: even the sea in the neighbourhood of the pestilence rejects its poisoned inhabitants. These stories are transmitted from one country and town to another; and it would appear that the cholera necessarily carries along with it certain falsehoods, some of them indeed, such as the plot laid by the physicians to poison the people, calculated for circulation among the lower ranks; others, however, such as the above zoological novelties, for the edification of the *soi disant* educated classes, and for the instruction of medical inquirers.

Lastly, the epidemic influence, considered as the cause of cholera, is said to show its effect by producing peculiar features in the *general state of health* of a town or country previous to and during the prevalence of that disease. Upon this subject, however, the most contradictory statements are made in public and in private by medical men—statements which can only be reconciled when we reflect upon the usual uncertainty of medical facts when they are broached in this general manner, and which afford a new instance of the necessity of extreme caution in relying on general results obtained in this manner.

You are aware that German pathology has always laid much weight upon the doctrine of *stationary and annual epidemic constitutions*—a theory proposed, with every appearance of being founded upon experience, by Sydenham, and adopted and developed by Huxham and Stoll. I shall not, in this place, enter into a critical examination of this theory, such as it is

now taught in our schools, and advert to it only in order to notice that the results obtained by some of our medical men, as to the general state of health connected with the appearance of cholera, seem to me to be derived rather from the habitual influence of this theory than from accurate and unbiassed observation.

The following may be stated as the medical facts usually advanced in evidence of the epidemic constitution attendant upon cholera, (and it must be admitted that there is a remarkable degree of uniformity in the phenomena which have excited attention in various and remote situations.)

‘The malignant cholera has been preceded for days, weeks, and months, by an unusually frequent occurrence of the common *cholera morbus*, of dysentery, or of diarrhœa. There is, before the appearance of the cholera, a general tendency to gastric affections, which at last degenerate into this malignant disease. In towns and districts affected with cholera, almost all diseases which occur have something of the character of cholera. Other epidemics cease altogether; no other diseases are heard of. Where the cholera prevails, almost everybody is more or less subject to the epidemic influence, evinced by some uneasiness, some derangement of the bowels; no person feels quite well, or as he was accustomed to feel.’

I shall now inquire into the truth of these reports, and, supposing them to be true, into the real causes of this supposed epidemic constitution.

Cases of common sporadic cholera have occurred in all countries, and will continue to occur as long as the animal economy is subject to the morbid influence of cold and intemperance; their frequency is well known to depend in some measure upon atmospheric changes, and particularly upon sudden vicissitudes of temperature. It is the peculiar character of this disease to exhibit a quick concurrence of alarming symptoms, a violent reaction accompanied by a sudden depression of some of the vital actions; but it is not less remarkable that a sufficient reaction against the morbid cause having taken place, or the turbulent state of the functions having been calmed, the economy in general speedily returns to its healthy state. In this respect the contagious cholera differs widely. I admit that there are few symptoms of this affection, which, *singled out*, may not have occurred in some one instance of common cholera; but I can only put the question to the candid experience of any medical man who has seen the two diseases, whether they are not, in their total appearance, widely different. I cannot but think, that if the Indian disease had reached this country unknown to us, and without the name which it unfor-

fortunately bears, few persons would have thought of giving to it an appellation in familiar use, for an affection with which, in general, it has only the least essential symptoms in common.

When medical men in countries contiguous to those in which the contagious cholera prevails, assure us that their attention has been more than formerly directed to cases of sporadic cholera, we must admit the truth of their statement; but it seems natural, that when the danger of the Indian disease comes near, they should more carefully study its European namesake, and it does not by any means follow that any connexion exists between the two occurrences. At this moment the contagious cholera prevails in Vienna; and I am informed by the physicians from the south of Germany now here present, that not only in Bavaria, but in Würtemberg, and on the Rhine, common cholera frequently occurs. The governments as well as inhabitants of these provinces are in the utmost degree alarmed at present. I presume, and I hope that my prediction will be fulfilled, the contagious cholera will not be transmitted to them till next year. Is it likely, then, that the common autumnal cholera of Würtemberg is owing to the same epidemic influence which is supposed to have advanced from Hungary to Vienna during this summer?

At Berlin, also, some cases have, during the course of this summer, occurred in the practice of respectable medical men, which at the time excited much interest by the analogy which they seemed to bear to the descriptions of Indian cholera. But they were few, solitary, and all of them terminated favourably, notwithstanding an alarming array of symptoms. The occurrence of the first genuine cases of Indian cholera on the Spree-boats must have removed from the minds of those physicians every idea of analogy with the above cases*.

When the cholera was, during the months of July, August, and September, transmitted to a great number of towns and villages in Prussia, it could not fail to find in some of them the

* I have here alluded to the real common cholera. Cases of a very different description have occurred at Vienna. The 'sporadic cholera' had, in that capital, prevailed since the 15th of August, the Indian cholera having, by order of government, *halted* on the Austro-Hungarian frontiers. Nevertheless, deaths occurred in Vienna in great numbers, the mortality was daily increasing, but business went on as usual, when, on the 14th of September, after a violent rain and storm, and after numerous casualties among the highest ranks of society, the imperial government declared, that *on that day* the epidemic cholera had appeared. As this government is *infallible*, although it has twice changed its opinions and its measures on the subject of cholera, the 'sporadic cholera,' which had committed such extensive ravages before the official arrival of the 'genuine epidemic cholera,' could be ascribed only to the 'gradual extension of the epidemic influence.'

usual diseases of the season, bilious fevers and dysentery. But there is no reason whatever for believing that these diseases were in general more frequent or malignant during this, than during former summers; nor is there any evidence that they prevailed to a greater extent in the districts afterwards attacked with cholera, than in the contiguous and intermediate districts which remained free from that scourge.

In the city of Berlin, the contagious cholera has appeared, as I can most positively affirm, not unexpectedly indeed, but suddenly, and not preceded by any diseases, which might have been regarded as transitions. I have already alluded to a change of weather which happened a fortnight before, and was immediately followed by a considerable accession of the common endemic intermittent fever. Judging from my own sphere of observation, the number of cases of this fever, which have occurred in Berlin during the last two months, must have been at least as great as that of the cases of cholera. Of course, it has excited little attention, because it is neither a new nor a fatal complaint. Nevertheless, if an epidemic constitution was to be admitted, it ought to be rather an *agueish* than a *choleric* one.

The fact now stated, shows that the asserted disappearance of other diseases when cholera prevails, is, in this country at least, untrue. At Warsaw, also, the typhus and the cholera coexisted. That no small-pox, measles, and scarlet fever are at this moment observed at Berlin, and that these exanthemata have not in other cities been found to commit great ravages at the same time with the cholera, we have every reason to regard as an accidental circumstance.

I have last to advert to the remark almost universally made in those European cities in which the cholera has appeared, viz., that the great body of the population is subject to morbid feelings, derangements of the digestive organs, diarrhœa, that, in other words, the choleric influence is in an unequal degree distributed amongst all. How is this singular phenomenon to be accounted for?

In the *first* place, it is true that a certain number of persons in places where cholera prevails, labour under diarrhœa and vomiting, with other symptoms, which we may consider as the cholera in a very slight degree. The number of persons thus affected is very different, according to the facility with which intercourse takes place in an infected town between the sick and those who are more or less disposed to the influence of the contagion. At Berlin, the number of persons subject to this choleric diarrhœa has been inconsiderable: they have been, almost exclusively, those who attended upon cholera

patients. We have already remarked, that in the hospital No. 1, of 70 to 80 attendants, 11 had cholera, and 35 others this diarrhœa, with vomiting, &c.

Secondly, common diarrhœa, colic, and oppression at the stomach, produced by the usual causes of these complaints, occur during cholera, as at all other times: but those who habitually took little notice of similar complaints, are now alarmed, send for a physician, talk much of their ailments, and make their friends talk still more of them. In this manner every day's occurrences are rendered the subject of public attention.

In the *third* place, derangements of the digestive organs are actually brought on by the sudden change of diet and regimen, which most persons thought it necessary to have recourse to at the approach of cholera. From an almost ridiculous horror entertained of everything laxative, it was urged, that cold water, small-beer, fruit, not only raw but even stewed, and many other articles of diet, in daily use, are noxious, and that white wine also is to be avoided; on the other hand, it was recommended to drink freely of red wine and of spirituous liquors,—besides, a variety of 'preservative' drops, pills, and powders, were swallowed;—and was it to be expected that the stomach was to submit to all this violence and absurdity with impunity? Costiveness, flatulence, colic, and diarrhœa, alternately followed in the same persons, and made some of them truly miserable.

The *fourth* element, however, in this epidemic *malaise*, is the influence of the mind upon the body, and especially upon the digestive organs. One must have experienced, in one's own person, the singular feelings of a first week of cholera, in order to conceive it possible how much not only hypochondriacs, but individuals in excellent health of body and mind, free from all fear and anxiety, may thus suffer, merely in consequence of consciousness being directed towards the function of digestion. In some persons, a feeling of discomfort has continued for days and weeks: they have been languid, little inclined to their usual occupations: the stomach, as well as the lower part of the intestines, have been the seat of unusual sensations, the peristaltic motion has been perceived (usually described as *rumbling* in the belly): sleep was disturbed by the involuntary thoughts of the approaching disease. In others, however, a sudden attack of anxiety, oppression of the chest, shivering, coldness of the extremities, has supervened, and caused great alarm to the patients and to their friends: on such occasions, cordials, warm drink, and external warmth, were instinctively had recourse to, and uniformly followed by a

most profuse sweating, which, having continued for a night or a day, left these individuals tolerably well, but weak and languid, and their stomach deranged by the prodigious quantities of fluid which they had often been forced to take by their apprehensive friends. In many instances, an attack of this description turned out to be the first paroxysm of a mild intermittent fever, which recurred, with its usual symptoms, in the tertian type, the phenomena of the first fit only having been masked, as it were, by the 'epidemic constitution' of the mind.

Few of the persons, however, affected in the manner now described, are disposed to ascribe these symptoms to their own manner of living, and to the influence of the mind; few of them, indeed, are aware of the general dependence of the corporeal functions upon the workings of the mind, particularly where these are uninfluenced by the will, or even by clear and distinct consciousness*. We cannot, therefore, be surprised that there is, on the part of the public, a general tendency to ascribe these phenomena to a prevalent 'epidemic influence;' nor that many medical men also, from conviction or from interest, proclaim this influence. We accordingly have had at Berlin, besides the genuine cholera, a '*pseudo-cholera*,' '*cholerrina*,' '*choleroïd*,' or, as others have termed it, a '*choleric anxiety*.'

Only by the existence of these new complaints also is it possible to account for the singular difference which has been experienced by the medical practitioners of this city as to the number of the cases of cholera treated by them in private, and as to the result obtained by their treatment. Thus, a well known physician, not attached to any hospital, and whose practice is of moderate extent, and chiefly in the middle classes of society, alludes, in a work which he has recently published, to *thirty cases of cholera successfully treated by him*, whilst my own private practice has not afforded me one specimen of the disease, and only six cases† have as yet happened in the whole

* I do not hesitate to say that I have made no exception to the general rule; and that, from the day and hour when I had performed the first cholera dissection, for at least a week I was in a peculiar state of excitement, which was soon followed by a transitory derangement of the digestive function, and increased and decreased as I thought myself more or less exposed to the effluvia of cholera. I have witnessed several cases in which the above attacks supervened immediately upon reading in the newspaper the daily report of the sick; in other instances, they supervened upon having witnessed the transport of a cholera-patient: hence they have, in my practice, been more common among those who lived in streets near the cholera-hospitals, and on the road to the burying-ground, and who were frequently annoyed by the sight of the cholera-baskets, and by the nightly rumbling of the waggon which carries the dead.

† Exclusive of *four or five cases*, evidently connected with the small

district officially intrusted to my care,—a district of 5000 inhabitants, embracing however, almost exclusively, the houses of people in easy circumstances. Nor has a single case of cholera occurred in any of the numerous families who habitually consult my valued friend Dr. Horn, well known to have by far the most extensive practice in Berlin.

On the other hand, the pseudo-choleric array of symptoms is by no means common among the lowest ranks of the population, the class who, being most exposed to the cholera, ought certainly to be eminently subject to the choleric constitution. The labouring classes, however, have too little spare time to attend to the minute changes in their corporeal functions; they have too many real wants, to annoy themselves and others with speculations on the influence of the epidemic genius upon their own constitution. There is no truth, accordingly, at least in Berlin, in the statement that the *great body of the population* is subject to diseased action and morbid sensations; although the prevalence of these phenomena among the higher and middle ranks of society may be admitted as a fact, but is to be ascribed to other sources than the imaginary miasma of cholera.

The discussion into which I have entered on the efficient cause of cholera will probably appear to you to have been unnecessarily protracted. It may be, that the question which I have so fully investigated appears to you a very simple one: still I have thought it necessary to be minute, at the risk of being tedious; and I shall mention my reasons. As long as the cholera has not reached a country, there is a general disposition to admit the sole action of contagion; as soon as it has appeared, a general re-action ensues, the public and medical men quit the banner of contagion, and proclaim 'the epidemic influence.' This change of opinion has been almost uniformly observed; I have no doubt it will likewise happen when this disease shall have reached England. Only those who are in full possession of the whole facts, and do not allow particular results to interfere with general experience, will be able to resist the torrent, strengthened as it will be by false reasoning, and all the feelings of constraint and inconvenience caused by preventive measures. I have the fullest conviction, that the view I have laid down is the true one: yes, I know that it will not be a popular one, and that a series of years must elapse before it will meet with general assent.

I now proceed to state what experience has shown, as to cholera-institution of this district, i. e. among the attendants and those who had intercourse with these persons.

the *mode of action* of the contagion of cholera, and to the circumstances which favour its production and its efficacy.

I. The nature of this effluvium and its physical properties are far from being known: there is no satisfactory proof of its proceeding either from the vomit, alvine evacuations, or sweat of the patients; nor can it be with any certainty ascribed to the air exhaled by them: perhaps it is produced by a mere passive evaporation from the body, which passes into the surrounding atmosphere.

II. Various opinions are entertained as to the period of the disease in which the effluvium is generated. On the one hand it has been observed, that the propagation of cholera in the same house or family occurred most frequently when the first case had been a fatal one, and when the dead body had remained in the house: further, that the number of those taken ill, after having dressed, carried, and buried the dead bodies, is proportionally even greater than that of the sick attendants. These facts have led to the conclusion, that the cholera effluvium is chiefly or exclusively generated during the last period of life, or after death. There does not seem to me to be any evidence of its production in the dead body; but it is probably accumulated in the clothes of dying patients*.

On the other hand, an analogy has been attempted between cholera and the contagious exanthemata, according to which it has been supposed that the contagion is not produced during the cold fit of cholera, but owes its origin to a later period of the disease,—namely, to that in which the patients pass into the convalescent state. This opinion is even stated as the result of observation by Dr. Goldberg, who treated the disease at Kalisch at Poland, and by Dr. von Gumpert, of Posen. Dr. Goldberg reports, that of the attendants who were engaged in rubbing the cholera patients not one took the disease, whilst *eight* attendants in the convalescent wards died of it. I am not aware, however, of any facts observed in Berlin in corroboration of this view. Dr. Romberg, physician to the Cholera Hospital, No. 1, states to me, that none of the

* In the Appendix (No. II.) several instances of the propagation of cholera occasioned by funerals are mentioned. In the Pomeranian village Neuwedell, near Stargard, the first death from cholera having occurred, and the medical man having ordered the body to be privately buried, the friends turned him out of the house, and the body was publicly exposed for two days. A few days afterwards all the inhabitants of the house died, and the disease now spread to such an extent, that when the official report was made, 140 persons had died, and 100 remained ill.

attendants in the convalescent ward have been taken ill, and that more than thirty persons sent to the hospital on the suspicion of cholera, but who, proving not to labour under that disease, were immediately transferred to the same wards, also remained free from it.

III. The cholera effluvium seems, like that of typhus and small-pox, to act with greater intensity when it is accumulated in close and unventilated apartments, and to be rendered innocuous where free access is given to the air. The disease is on this account so frequently propagated in the cabins of boats, and in the small, unwholesome habitations of the poorer classes.

IV. This effluvium acts chiefly upon those who have been exposed to its operation for some length of time; and there is no evidence of mere transitory contact with cholera patients, or a momentary residence in the atmosphere surrounding them, having produced the disease. It is impossible to decide whether the effluvium is received into the animal economy through the skin, or through the respiratory or digestive organs.

V. The time during which the contagion having been received by a person remains latent, seems to be different, but it seldom extends to more than four, five, or six days. Dr. Albers, sent by the Prussian Government to Russia, in order to collect information on the cholera, has stated to me as his opinion, that the contagion may sometimes remain latent for a longer time, the economy being in a state of corporeal or mental excitement, and the disease at last develop itself when this excitement has ceased. He has observed persons who, having been exposed to contagion, continued well on a long journey, but were taken ill when they arrived at home. There are numerous cases on record, in which the disease showed itself within a few hours after exposure to the contagion. This short period, which elapses between the exposure and the appearance of the disease, is, on the one hand, to be regarded as the cause of the rapid spreading of cholera: on the other hand it is an important fact, as influencing the duration of quarantine measures.

VI. It must be regarded as extremely probable, if not certain, that the contagion of cholera may be communicated to persons who have not been exposed to the immediate effluvia of cholera patients, and through the medium of individuals who are at the time not labouring under the disease. In some instances these individuals themselves remain quite well, in

other cases they are attacked with the disease some time after those to whom they have apparently transmitted the contagion. It seems impossible to decide whether the contagion under these circumstances is attached to the clothes or to the body of the person who carries it with him.

In addition to the case adduced, page 11, and to those to be found in the Appendix, I shall here give room to the following instances of this indirect transmission of the contagion*.

Dr. Lieber, of this city, reports that he was called to see two children of a labourer ill of cholera: he found one of them dead, and the other dying. The mother accused a female lodger of dissolute habits, who lived with the skippers, of having brought the disease into the house: this woman denied being herself ill, but she had commenced vomiting and purging, and died of cholera in the night following. In the same night an old woman who had taken charge of the other children of the same family, died in another apartment of the house: it was maintained that she had no intercourse with the sick children, but with the woman who had transmitted the disease. About twenty cases of cholera, more or less severe, happened in this house.

A family in Berlin took a dry nurse in the place of a servant girl, who had had charge of the children, and was dismissed. The nurse, on arriving, laboured under diarrhœa. Soon afterwards one child took cholera and died; next day the nurse and three other children entrusted to her care were attacked with the disease, which proved fatal to the woman and to one of the children. On the same day when these persons were received into the hospital (No. 2), the servant girl, who on the day of leaving the family had been in company with the nurse, was also brought to the same institution and died in the evening.

A man servant was attacked with cholera in the house of his master, in a fashionable part of the town, till then free of cholera. On inquiry I was informed by him that he could not possibly have been exposed to contagion; his master being very anxious to avoid the disease, and having given very par-

* Dr. Bidder, inspector of medical affairs in Curland, writes to the Prussian *Immediate Commission*:—‘I formerly believed the propagation of cholera by indirect communication to be very doubtful, but some recent observations have considerably diminished my doubts. A Jew having been in Riga on the 17th of July, returned on the 18th to the town of Tuckum, in which there had been no trace of cholera. On the 25th the Jew’s wife died of cholera, and the disease now rapidly extended from house to house. A Jewish carrier had secretly entered the town of Mitau, in which the cholera prevailed: he returned to the town of Hasenpoth, a distance of fifty English miles, and gave to his wife a worn shawl which he had bought in Mitau. A few days afterwards the woman took the cholera, and thus the disease extended.’

ticular directions about keeping at home, avoiding suspicious persons and places, &c. I asked him whether he was not acquainted with any hospital attendants, and learned that he went every day to dine with his wife and children, who lived in the same house with one of the attendants of a small cholera hospital in the neighbourhood*.

VII. There is in the whole history of cholera no authenticated case in which the contagion has been transmitted from one place to another by *letters, new clothes, or merchandize* of any description. In a few instances in which the propagation of the disease has been attributed to similar articles, there had at the same time been intercourses of living persons, who may with much greater probability be regarded as the bearers of contagion.

VIII. *The contagion of Cholera exerts its deleterious influence only under very peculiar circumstances.* It may be regarded as a general truth, that a person in good health may be exposed to this contagion even for a length of time, and under circumstances otherwise unfavourable, *without deriving from it any injury whatever*, and that the disease is actually produced only when the animal economy is at the time of the exposure, or whilst it continues to be under the influence of the contagion, in an unfavourable condition. It is chiefly this small proportion of individuals who are attacked with cholera, among the great number of those who are exposed to the contagion, which has made so many observers unwilling to admit that agent as the essential cause of the disease. Wherever the cholera prevails, numerous instances are brought forward of persons who have not only come in contact with the sick, but have spent hours and days with them, attended, washed, and rubbed them, laid themselves in bed with them without taking the disease: and a large proportion of the medical men and other attendants has usually remained free from it. A similar immunity is to a certain extent indeed observed, in all other contagious diseases, and there is none, which may strictly be called *absolutely contagious*, i. e., in which intercourse with the sick necessarily transmits the disease. Still there is every reason to believe that to a person in good health, the chances of being

* The following cases are mentioned, but I do not know them to be official:—

A gunner went one evening to see a public woman, and immediately after called upon his mother, an habitual drunkard. In the night following both women died of cholera; the gunner remained well.

A woman died of cholera, having a child at her breast. Another woman took pity upon the orphan, and offered to nurse it. She also died of cholera; the child was not ill.

attacked are smaller after having been exposed to the effluvia of cholera, than after exposure to any other contagion. The great number of persons attacked in some of the towns and countries which the cholera has visited, is therefore to be ascribed rather to the rapidity with which the virus is generated and the disease developed, than to any great susceptibility on the part of those who are exposed.

IX. The circumstances by which the constitution is rendered susceptible of being affected by cholera, seem to be chiefly the following:—

1. *Exposure to Cold.*—It is well known that no external agent so frequently injures the animal economy, as a sudden vicissitude of temperature: we find, accordingly, that a large proportion of cholera patients, like those labouring under other diseases, ascribe their illness to the influence of cold. It is difficult, however, to ascertain what precise share the exposure to cold alone may have in the production of the disease, and what allowance must be made to the predilection for that morbid cause so generally shown by all classes of patients, when they are desired to account for any disease. Accordingly, opinions differ considerably as to this point: Dr. Casper, physician to our hospital, No. 4, informs me that in the course of his observation, cold and emotions of the mind seemed to be almost the only concomitant cause of cholera; whilst on the other hand Dr. Romberg, physician to the hospital No. 1, thinks the influence of this agent of little moment. Dr. Bahn, physician in No. 3, reports that he found cold the most frequent precursor of the disease.

2. *A debilitated state of the stomach and intestines.*—Experience has shown that in a large proportion of cases of cholera, the disease has been preceded by a deranged state of the stomach and intestines. In some it has supervened after the immoderate use of indigestible food, and in this respect particularly raw fruit, cucumbers, cabbage, fish, and fat meat, have become the subject of popular apprehension, although it is probably difficult to ascertain with accuracy that any one of these articles has been peculiarly offensive; in others large draughts of small beer, but particularly the free use of spirituous liquor has been accused as productive of the disease. The cholera has found numerous victims among habitual drunkards, and those who are fond of much eating.

It has been frequently observed that cholera supervened upon a looseness of the bowels, which was supposed to be owing to cold, or to an indigestion, and which continued in a moderate way till the other symptoms of cholera suddenly shewed them-

selves. This phenomenon admits of two modes of explanation: it may either be supposed that the disease existed from the commencement, in the form of a gentle diarrhœa, and required some days to arrive at its height, or, that persons labouring under diarrhœa from other causes, on being subsequently exposed to the contagion of cholera, readily took this disease. I have reason to believe that both suppositions are true in different cases: that on the one hand it is not advisable to expose oneself to the effluvia of cholera, whilst labouring under common diarrhœas; and on the other hand, a moderate diarrhœa sometimes supervenes immediately after exposure to the contagion, and requires two or three days before it passes into cholera.

In some instances cholera has been preceded by a costive state of the bowels, which has suddenly given place to a looseness.

In general every cause, external or internal, which debilitates the digestive function, seems powerfully to increase the disposition of the economy to suffer from the contagion of cholera.

3. *Fatigue* also seems to render the animal economy more susceptible of this agent; at least this is probable, from the frequent occurrence of cholera among the medical and other attendants of the sick.

4. *Emotions of the mind* are frequently found to bring on this disease, in those exposed to its efficient cause.

It is commonly reported, that in cities infected with cholera, the fear and apprehension of the disease, is of itself sufficient to produce it, nay, that this state of the mind is one of its usual causes. I have every reason to doubt the truth of this fact. It is well known that in Berlin, that class of society which entertained the most exaggerated fear of the cholera, remained almost entirely free from the disease, whilst it suffered generally and severely from the peculiar symptoms to which I have formerly adverted, under the name of *anxietas cholericæ*. I know numerous individuals among my patients and acquaintance, who have during the first weeks of the prevalence of cholera, lived a truly miserable life of anxiety and fear; yet none of them has been attacked with the disease.

On the other hand other emotions, such as grief and despondency, and violent anger have frequently seemed to bring on attacks of cholera. Most of the hospital physicians have made this observation. Unfortunately those who are exposed to the contagion of cholera, from the persons of their relations and friends, have but too frequently a depressed state of mind forced upon them. Nevertheless, there are numerous instances

known, of persons who in the violence of grief and despair, have thrown themselves upon the bodies of their dying relatives, embraced and kissed them,—nay, even of those who, resolved not to survive them, have sought every opportunity to expose themselves, and who still remained free of the disease, which, on the other hand, seized some of those who approached the sick without the most distant idea of fear or anxiety.

X. The cholera often attacks persons who are labouring under other diseases. It does not, accordingly, follow the law which has sometimes been advanced as applying to the exanthemata, and other epidemic affections, viz., that they do not touch those who are labouring under other complaints. It would even appear, that febrile and nervous affections of various descriptions give a disposition to cholera. There have been numerous instances of individuals labouring under, or convalescent from the ague as well as from continued gastric fever who have been seized with cholera: among the female patients many had laboured under cardialgia and hysterical symptoms.

In the cholera hospitals of Berlin, it has not unfrequently happened that persons were brought in, and remained in the cholera wards for twelve, twenty-four, or even forty-eight hours, who were not affected with cholera at all, but having been introduced by mistake, were not removed, either because the diagnosis was at first not clear, or because there was no room for them elsewhere. These persons have sometimes derived no injury from sojourning in the cholera wards: in other instances, however, they have distinctly caught the contagion in the hospital. Thus two persons were brought in after fits of epilepsy, one to hospital No. 1, and one to No. 4; both of whom took cholera in the wards; another epileptic patient who had been carried to No. 4, was not affected. Dr. Romberg related to me that several men, brought to his hospital in a state of intoxication, were not hurt by the exposure to the contagion.

There are also occasional cases of cholera in the wards of the general hospital called '*la Charité*.' It there seizes upon cases of all descriptions, having first appeared in a ward containing old females, and from thence spread to various other portions of the house, although the patients, on being discovered to labour under cholera, were always removed to the cholera hospital No. 3*.

* The fact that several cases of cholera have happened among the lunatics, who occupy a sequestered portion of the *charité*, which they do not generally leave, has by some been brought forward as a striking argument against the possibility of contagion. Whoever is acquainted

XI. No period of life affords a protection against this malady, nor does there even seem to be any marked majority of cases connected with a particular age. Of the first thousand cases of cholera reported in Berlin, there were

Below 5 years	73
From 6 to 18 years	66
11 " 15	36
16 " 20	33
21 " 25	44
26 " 30	67
31 " 35	82
36 " 40	97
41 " 45	69
46 " 50	87
51 " 55	57
56 " 60	48
61 " 65	50
66 " 70	34
71 " 75	17
76 " 80	13
81 " 85	6
86 " 90	2
Age not reported	119
	<hr/> 1000

The greatest proportion of cases here belongs to the age from 30 to 50 years. It appears to me, however, that this period of life is very far from affording any other disposition to cholera, except that which arises from a more frequent exposure, on the one hand to the contagion, and on the other hand to cold and fatigue. It has been found on the contrary, that the cholera contagion having been communicated to a number of persons, children and old people have been more liable to suffer from it, than adults in the prime of life. In most of the houses in which several cases of illness have successively happened, little children have chiefly suffered: and the extension of the disease has been remarkably prominent in some institutions where many old persons lived together, (particularly in the 'New Hospital' in Berlin).

XII. It cannot be said that any station in society or occupation, gives a peculiar predisposition to cholera, excepting as

with the circumstances, however, knows that constant intercourse takes place between this and the other parts of the house by means of medical and other attendants, servants, and even some of the lunatics who are occasionally employed in menial service.

far as it produces exposure under the circumstances favouring the action of the contagion, mentioned under IX. The lowest classes of the people have furnished the bulk of cholera patients: but it must be kept in mind that they also form the great mass of the whole population, and there have been numerous instances of the cholera seizing upon persons in easy circumstances.

XIII. It may be regarded as probable, that the different states of the atmosphere are not without some influence upon the propagation of cholera. In favour of this supposition, it may be stated, that this disease, like other contagious epidemics, has sometimes been observed to diminish in its extent, and to disappear for a time, without any other external cause checking its progress. It is quite unknown, however, what conditions of the atmosphere are favourable or unfavourable to the extension of cholera, for it has been known to increase and decrease under circumstances of very opposite descriptions. There can be no objection to expressing this supposed dependance of cholera upon atmospheric agency, by the term of 'an epidemic influence,' as long as it is intended to mean by this name, not any positive sufficient cause of the disease, but merely an accidental concomitant, favourable or unfavourable to its development.

Having now submitted to you my remarks on the causes of cholera, I next wish to give some hints on the *prevention* of this disease, a subject of paramount importance, as from what we know of the causes, it must appear that human prudence may go a great way in avoiding this malady, while unfortunately when once present, it has hitherto proved to be an enemy to life very little indeed controllable by human art.

The latest experience has shown that the devastations of the cholera in all German provinces, have been much more limited than in the various countries which have formerly suffered from it: a result which is undoubtedly to be ascribed in a great measure to the advantage of civilization. The preventive measures pursued in Danzig, Königsberg, Berlin, Breslau, Hamburg and Vienna, have been very various, but in all these towns the mortality from cholera, in proportion to the whole population, has been much smaller than in Petersburg, Moscow, or Astrachan, and cannot be compared with the ravages which the cholera has committed in India and in the Levant. It was to be expected indeed, that the intellectual superiority

which even the lowest classes of the population in free and civilized countries, enjoy over the slavish multitude of the oriental nations, and even over the serfs of the east of Europe, would tend to lessen considerably the injury produced by a malady, which according to what we have ascertained as to its causes, must always have uncleanness, indigence and ignorance, for its most powerful auxiliaries.

The progress of the disease through the continent of Europe is at this moment slow: its germs are not now transmitted by war from one country to another; it has not approached any very thickly populous districts, and the contagion is not likely to spread rapidly either on the few channels of communication by land and by water which exist beyond the river Elbe in the North, or on the land-road* from Austria to Bavaria in the South of Germany. Only on the coast of the German Ocean it may be expected to creep on from the mouth of the Elbe to those of the Weser and Ems, and to Holland. The exaggerated fears which had been entertained throughout Germany are abating, and after a long and painful excitement, the public returns to its wonted state of tranquillity, and begins to look upon the cholera in nearly the same light as upon other epidemics and contagions to which these climates have hitherto been subject.

What has Great Britain to fear from the cholera? It is evident that the geographical situation of the British islands alone can afford no protection from a disease which has extended over all climates. The natural boundaries, however, which the sea affords, will undoubtedly facilitate the execution of the measures calculated to prevent the irruption of the cholera, and give Britain a chance of immunity, of which the continent of Europe can now have no expectation.

It deserves to be remarked as a singular circumstance, that the *contagious continued typhus* or *fever*, which on the continent scarcely ever prevails except during long and fatiguing wars, and disappears soon after the conditions favouring its continuance, viz., the march of troops, transports of prisoners, and of sick soldiers, military hospitals, and the other miseries connected with war, have ceased—that this fever finds almost constant fuel in almost all the larger cities of England, Scotland, and Ireland, particularly in the two latter countries, and in the manufacturing districts of the former. It sometimes prevails in these towns to an inconsiderable degree, but is never known to leave the country altogether. It can scarcely be supposed that this

* The Danube does not admit of navigation *up* the river.

difference in the state of health in Great Britain and of the continent of Europe is owing to any peculiarity in the climate or soil : it has indeed never been satisfactorily accounted for ; but it must evidently be ascribed to some peculiarity in the manner of living of the working classes. I do not remember to have seen any statement of this fact, which has always appeared to me worthy of investigation. I have for several successive years observed the contagious continued fever in Edinburgh and Glasgow ; and I am very sure of not having, during the last six years, met with an analogous form of disease either in France, Germany, or Italy, with the only exception of an epidemic, which occurred among the garrison at Munich, in summer 1826. Continued fever of the typhoid form of course occurs everywhere, but not with that decidedly contagious character of which the fever in Great Britain is possessed. It would lead me too far to inquire, in this place, whether it be chiefly the quality of food, or the close unventilated dwellings, or the habitually depressed state of mind of the poor inhabitants of the large cities of Great Britain, which fixes the contagious fever among them ; but I cannot but apprehend that the same causes which in so peculiar a manner favour the development of *typhus* in the British islands, will also produce an increased predisposition for *cholera* should this disease make its way into these islands.

But if the danger is great and imminent, much may be gained by meeting it in a proper way. I understand that the British government has followed the example of the continental states, and made active preparations for opposing any irruption of the cholera. We have in this country acquired an *expensive* experience on this subject, which it is to be hoped other nations will profit by. It is with this view that I submit to you the following remarks on the prevention of cholera.

I. Of the means of preserving *whole countries and districts* free from cholera. A contagious disease can be transmitted from one place to another only by intercourse of men, goods, or chattels between infected and healthy districts. The plague and the yellow fever have hitherto been the only diseases, the introduction of which has been opposed by a *rigid control of such intercourse* : with regard to the plague these measures have generally been successful,—in the yellow fever reasonable doubts are entertained as to their necessity ; other contagions have been regarded as too generally spread, or as too little dangerous to the public to render such measures advisable. We shall now inquire in how far they are applicable to the Indian cholera.

A country being threatened by a contagious disease, which it is intended to check by a limitation of intercourse, three different modes of sequestration may be had recourse to:—either the whole country, *being healthy*, endeavours to exclude the disease by preventing or controlling all intercourse with the neighbouring infected countries: which I shall call the system of *exclusion*; or, any *one district*, town, or village of the country *having become infected*, the usual intercourse between this infected part and the rest of the country may be prohibited: which we may term a system of *inclusion*; or, a great part of the country being under the influence of the disease, those districts, towns, or villages which are *not infected*, intending to maintain themselves free, may give up or restrain all intercourse with the suspected parts of the country, and pursue a system of *seclusion*.

In judging of the efficacy of preventive measures, it is very necessary to distinguish these three modes; they are founded upon different principles, and attended by different effects. I shall notice the manner in which they have been adopted in Prussia, and inquire whether they are applicable to Great Britain.

1. Of the system of *exclusion*. When the Prussian frontiers were threatened by the appearance of cholera in the contending armies of the Russians and Poles, and among the inhabitants of the border districts, it was found advisable to appoint an 'immediate* commission for the prevention of cholera,' consisting of certain members of the administration, several military men, and some civil medical officers, under the presidency of Major General Von Thieles, one of his Majesty's Aide-de-Camps. A military line was immediately formed along the whole extent of the Eastern frontiers of the kingdom—from the shores of the Baltic to the territory of Krakan, above 600 English miles in length; and regulations were issued, controlling all intercourse of men, goods, and chattels, with the infected Russian and Polish provinces, according to the principles adopted on the Austrian frontiers against the irruption of the plague.

Scarcely had these arrangements been accomplished when the cholera suddenly appeared (May 28) at Danzig, a situation remote from the frontiers. The line on these frontiers

* Immediate, because it derives its authority immediately from the King, and acts independently of the different ministerial boards (each of which, however, has its representatives in the Commission), issuing its orders to the provisional, civil, and military authorities, all of whom are, for this particular object, placed under the direction of the Commission.

however was still maintained, and it proved effective for several months, as may be seen from comparing the dates of the commencement of cholera in the contiguous Polish and Prussian districts. It was first broken in several spots in East Prussia, and in the southern extremity of Silesia, where some border villages were infected apparently by smugglers, and by the soldiers employed in watching the frontiers, who were imprudent enough to mix with the inhabitants of the opposite Polish side. The disease was, however, repeatedly checked in these situations, and did not extend to the interior of the country. But when, at the end of June, the main body of the Russian army approached the Vistula, near the Prussian frontiers, where it derived its subsistence merely from the provisions bought in Prussia, or transported through that country from the sea-ports of the Baltic, it became extremely difficult to maintain the sanitary line, when a large proportion of the inhabitants were interested in circumventing the regulations. We accordingly find that it was at this time, and in the district in which this traffic took place (Department of Marieneverder), that the cholera first extensively broke through the sanitary line. Another channel which it took was the river Warthe, which, taking its origin in the kingdom of Poland, flows into the Prussian province of Posen. The bulk of the population in this province consists of Poles, many of whom the ties of relationship and nationality still attach to their neighbours in the kingdom, with which they were just at this time carrying on a continued intercourse of a political nature, unknown to, or at least unnoticed by the government of Prussia.

The border line having now been broken on many points by the disease, which began to extend in the eastern provinces, new attempts were made to protect the rest of the kingdom of Prussia, and with it the north of Germany, by additional military lines; all these endeavours, however, proved unavailing, for before one line could be finally arranged, the disease was found to have penetrated into a district beyond it, and the Vistula, Oder, and Elbe, having been successively but unsuccessfully relied upon as barriers, the task of arresting the progress of cholera into the interior of Germany was finally given up as hopeless. It could never be expected indeed to be practicable after the disease had gone beyond the frontiers of the kingdom. It was, and it always will be, *impossible* efficaciously to control, for any length of time, a line of several hundred miles in extent, in a flat, open country, in which woods and marshes afford easy shelter to smugglers and all other persons who have any object to gain in trespassing.

Our numerous and well disciplined army, even with the assistance of the landwehr (militia), proved altogether insufficient for that purpose; and it was melancholy to observe, that the very troops of the sanitary line quartered in unhealthy situations, at the approach of the inclement season, suffered severely, not only from occasional cases of cholera, which penetrated among them, but still more from the endemic fevers of the country. I am sure that it will give you pleasure to peruse the proclamation which the king of Prussia issued under these circumstances, and of which I shall add a translation in the appendix.

It is not to be expected that the minor states of Germany will attempt to keep off the cholera by military lines; they will probably restrict themselves to controlling as much as can be done in the ordinary way all intercourse with infected districts. This precaution will prove of some advantage, but it will not finally suffice; and it may now be anticipated that the *system of exclusion*, which has proved unsuccessful in Prussia, will not prevent the ultimate extension of cholera over the whole continent of Europe.

The natural boundaries of Great Britain and Ireland afford considerable facility in carrying into effect measures analogous to those now adverted to, without the assistance of a large military force, and without the enormous expense which they have caused in Prussia: and there is some probability of a success greater than that which has been, and always will be, experienced on the continent of Europe. Our knowledge of the nature of cholera leads us to believe that it will prevail in Europe for an indefinite period of time; all regulations accordingly which may be made against its irruption into the British islands, must, above all, be of such a kind *as to be compatible with the existence of social and commercial intercourse, although they continue in action for many years*. If this be not the case, public opinion will declare itself so strongly against these measures, that it will soon be necessary to retract them altogether, and to do nothing at all, instead of doing too much. The more burthensome also the sanitary laws are, the more certainly will they be openly or secretly circumvented by those whose interest suffers from them; and a plan of concealment and deceit will then in all probability be pursued, not only by private persons but by the local authorities of the districts threatened by the disease, which will frustrate all endeavours to render the system of exclusion efficacious, and by which, on the contrary, the invasion of the malady will be rendered more dangerous, because less controlled.

Taking into consideration, on the one hand, the results of experience as to the mode of action of the effluvia of cholera, and, on the other hand, the absolute necessity of attending to the commercial interest, and weighing the losses which it may be allowed to sustain, against the injury to be anticipated from the disease, I am inclined to think that the system of exclusion should, as long as it is adhered to, proceed on the following principles.

All vessels approaching the ports of Great Britain should, before they enter, or before the crew and passengers go on shore, be subjected to a strict examination of their state of health.

Wherever a suspicion of cholera arises, the crew and passengers ought to be removed from the vessel, and the holds of the vessel, but particularly the beds and hammocks, should be washed and ventilated.

The persons thus placed under observation should be kept for a few days (3, 4, or 5,) in a healthy, airy situation, well fed, washed, and bathed; and dismissed if they have continued in an unexceptionable state of health for that period of time.

I suppose a suspicion of cholera to arise, not so much from the vessel having come from an infected port, as from cases of cholera or choleric diarrhœa having happened on board during the voyage. The control of the state of health of the crews and passengers would be considerably simplified by certificates of health being given to every individual sailing for Britain by the British consuls in the continental ports. I think it a very useless and superfluous precaution to subject a vessel to quarantine, every living person on it possessing such a certificate, and having continued in good health from the time of sailing till his arrival in a British port.

I should object to the plan of keeping the crew and passengers in quarantine *on board their own vessel*, where they continue to be exposed to the same effluvia to which the production of the disease can only be ascribed. The period of twenty, or even ten days, seems too long for the observation even of those persons who are suspected of intercourse with the sick.

There appears to be no good grounds for apprehending an importation of cholera by merchandize, and for subjecting goods to the various tedious and annoying operations which are in use for the purpose of destroying the contagion of the

plague. Nor should I be inclined, in this respect, to admit of any difference between various descriptions of goods as more or less apt to attract the contagion. The clothes and beds of those who have laboured under cholera appear to be the ONLY just objects of apprehension.

II. By the system of *inclusion*, it is intended to sequestrate those villages, towns, or districts, which may be infected with cholera, and by this means protect the rest of the surrounding country from the malady. This plan was, in Prussia, first attempted, when the city and territory of Danzig was declared to be infected. A military line was formed round the city, at a distance of about twelve or fifteen English miles from it, and kept up for nearly two months. It was observed that the cholera invaded almost every village within the boundaries thus put round it, and several times broke into the line and attacked the soldiers and the inhabitants of the neighbouring villages, so that the military posts found it necessary to retrograde, and to give up several districts. The total number of the villages, however, *without* the line, into which the cholera penetrated, was very small in proportion to those within its limits; and if the disease had not entered Prussia from other directions, it would perhaps have been possible to have prevented it from going beyond the territory of Danzig. But the difficulties and vexations caused by this sequestration of Danzig to the administration and judicature of the province, the capital being thus separated from the greater part of its dependencies, the annoyance to trade and commerce, the high prices of the most necessary articles of living owing to the interruption of intercourse, and the general dissatisfaction thereby excited among the middling as well as the lower classes, the expense of maintaining the military lines and the quarantines connected with them, the losses sustained among the young men of the line and Landwehr, exposed in a painful service to fatigue and disease:—all these circumstances at last created an imperious necessity of giving up these preventive measures in the environs of Danzig as well as of some other smaller towns, where similar attempts had been made to limit the disease.

The experience of Prussia in the good and bad effects of this system of inclusion will, it is to be hoped, prove an example to other countries. In no country will it be advisable to sequestrate by military lines and quarantines any considerable district or populous town: it will be next to impossible to make a measure of this description effectual; intercourse will always continue through secret channels, but the evil of the system will never fail to show itself. And of all European

countries Great Britain is the one which least admits of an interruption of intercourse with any of its large towns, a measure which would endanger the existence of many thousand souls, and which would most certainly offend the people, unaccustomed to any restraint of personal liberty, in the highest degree. Nor can it be denied that it appears very doubtful whether shutting up a town or district with pestilential disease prevailing in it, is at all a justifiable act, in as far as the inhabitants of the sequestered territory, the healthy as well as the diseased, are thus materially injured in all their interests, and more exposed to the various concomitant causes of cholera; so that a greater extension of the disease within the line of separation is to be anticipated from the attempt to prevent its transmission out of that line.

The system of inclusion appears to me to be applicable only if it should happen that the cholera shows itself in a small village or town, where it may reasonably be expected immediately to stop its progress, and where means can easily be found to indemnify the inhabitants for the losses which they sustained by being, as it were, all of them put in quarantine.

III. The system of *seclusion* on the contrary would be very generally applicable if the cholera was to extend itself over a great part of the British islands. It ought then to be recommended to the local authorities of counties, cities, and parishes, to take each, in their own department, proper measures for preventing an irruption of the disease. This plan is now adopted throughout Prussia; the government having taken away all barriers to communication throughout the country, but having left to the option of all *communes* and *circles** to protect themselves by such measures as are compatible with the interests of the country at large. Thus every village may refuse any stranger coming from an infected district permission to remain in the village, although he must be allowed to pass through it, or even to pass a night there in a quarantine building. The whole district of New Pomerania has till this moment secluded itself from the neighbouring country, and is permitted to make all those who enter it submit to a five days' quarantine.

There is reason to believe that private measures of this description will prove efficacious in a large proportion of in-

* It must be remembered that in 'despotic' Prussia the business of the *Gemeinden* (parishes), and of the *Landkreise* (hundreds), is managed by a magistracy elected by the inhabitants, and at the head of which are placed *Burgomasters* and *Landrätthe* (land-councillors), who are also chosen by their fellow-citizens, and approved of by the king.

stances, because they have in every particular case to be taken over a limited extent of surface, and still more because they are not only devised but executed by those who are to be protected by them, and who, accordingly, although they may be inconvenienced by them, will take good care that the regulations be strictly enforced; whereas, in the exclusion and inclusion systems, the force which forms the sanitary line is merely an agent in the service, and acting at the command of a distant authority, and the inhabitants of the districts where these lines are formed, far from having any interest in obeying the regulations, are only inconvenienced by them, and endeavour to thwart in every manner the intentions of the government.

The system of seclusion appears to me to be both applicable and important to Great Britain, and ought to be regarded as the most important means of preventing the *spreading* of cholera. It will require no immoderate exertions to protect a manufacturing town or district from the disease for the space of time during which it prevails in the neighbourhood: it would suffice to refuse admission into stage-coaches, canal and steam-boats, inns and lodging houses, to all travellers coming from infected districts, unless they produce certificates of health, which might be given by medical men and justices of peace. When, on the other hand, the cholera has once appeared in a situation where masses of poor population are crowded together under the most unfavourable circumstances, its ravages will be extensive, and very difficult to control.

II. Whatever opinion may be formed of the efficacy of the measure now alluded to, by which it is intended to oppose the invasion of countries, districts, and places by the cholera, it must be admitted that when that disease *has* shown itself in particular *houses, villages, and towns*, it is of great consequence *to control its further extension in these places*. The measures which have been recommended to this effect may be comprehended under the following heads:—

1. A suspension or limitation of intercourse between cholera patients and other persons, whose presence is not absolutely necessary. The original Prussian regulations proceeded, with regard to the suspension of intercourse with cholera-patients, upon the principles which have been adopted in cases of plague. Later experience has shown these principles to be quite inapplicable to cholera, where not in contact with the patient; but exposure to the confined effluvia of his body seems to be the principal cause of the transmission of the disease.

Undoubtedly the speedy removal of cholera patients to

hospitals appropriated to their reception, is the most important measure, not only in the cure of particular patients, but even in order to prevent the further transmission of the contagion. I think it necessary to enlarge on this subject, the principle being universally admitted in Great Britain in relation to typhus fever, as is evident from the existence of fever-hospitals in all principal towns of that country. The prejudices of the lower classes, unfortunately, often render the removal of patients impracticable, and in a country enjoying a liberal government, and where the rights of all ranks are protected by the same laws, no compulsion can force into hospitals those who are possessed of a dwelling. It is observed accordingly, that, notwithstanding the speedy establishment of excellent hospitals, a large proportion of cholera patients, even of the lowest classes, has remained at home in all Prussian towns where the disease has prevailed. Upon the whole the prejudice against hospitals is greater in this country than in Great Britain; nevertheless it would be advisable even there to devise every possible means in order to dispose the minds of the people still more in favour of public hospitals. In several German towns a practice is now adopted which deserves imitation; viz., that of admitting the public, and particularly the lower classes, to visit the hospitals intended for cholera patients, so that by acquainting themselves with the arrangement of such institutions they may gain confidence in them. This is the more necessary as the progress of cholera through Europe has hitherto been uniformly accompanied by the most absurd stories, circulated among the ignorant portion of the population, of poor patients being poisoned by the medical men, &c.

A question of some moment as far as regards the possible transmission of cholera is, whether the patients received into public hospitals should be allowed to be visited by their relations and friends? On the one hand it appears cruel to sequester the patients altogether from those who are dear to them, and it is not to be denied that even their chances of recovery are sometimes diminished by the anxiety in which they remain as to the state of their relatives. Nor is it to be believed that an occasional visit at the bedside of a patient in an airy and well-ventilated hospital, will often be productive of danger to those who thus expose themselves, being at the same time in good health. Still it is impossible to predict with certainty the presence or absence of a disposition to cholera in those who may demand admission to the hospitals; and the possibility of a transmission of the effluvia from them to other persons with whom they may communicate must also be ad-

mitted. It appears prudent, therefore, if not altogether to interdict, at least to reduce to the least possible extent, the visits of strangers to cholera hospitals. The hardship arising from separation to the patients and their friends, is less in cases of cholera than in other diseases, in one respect, viz., because the duration of the disease itself is generally short.

A similar restriction of intercourse is advisable, when the patients remain at home. Certainly the public authority should prevent the unnecessary visits of *strangers* to the rooms, or even to the houses, which must be regarded as tainted with the effluvia. In Berlin and other towns of Prussia the local committees appoint men who are to be had at a moment's notice, and whose business it is to attend the patients, as well as to prevent the intrusion of strangers. The question of separation is more difficult to decide upon as it regards the *relatives* of cholera patients. When a case of cholera is noticed by the medical or civic authorities, the patient has usually been so long surrounded by his relatives, that if a transmission of the disease to any of them is to take place at all, there has been full time for the reception of the contagion. If, therefore, there is any unwillingness on the part of the relatives to leave the patient, no persuasion or compulsion ought to be used to remove them; for there is great reason to believe that every agitation of the mind may act as a concomitant cause in bringing on the disease in those who are under the influence of the contagion.

2. A closure, or kind of quasi-quarantine of the houses or dwellings in which cholera has occurred, for a certain number of days after the patient's death, recovery, or removal to an hospital, was originally insisted upon in the regulations of the Prussian government; but the period first proposed, of twenty days, having been reduced, first to ten, and subsequently to five days, this measure was at last given up altogether as extremely irksome and useless. It is evident, that by merely shutting up a house suspected of having received the contagion of cholera, no essential advantage is gained, and the intended purpose, that of destroying the contagion, may be attained in a more expeditious and less inconvenient manner.

3. It has also been thought necessary to suspend for a certain number of days all intercourse between those persons who are, or have been, exposed to the contagion and the public. And if it be admitted, as probable, that those who have been under the influence of the effluvia, may, although not at the time labouring under the disease, transmit it to other persons

disposed to it, the necessity of restraining such intercourse, as far as possible, cannot be denied.

The measure originally devised for this purpose, and adopted in the first Prussian regulations, consisted in shutting up for twenty days all persons contained in a house where cholera had shown itself, and strictly prohibiting all immediate intercourse between them and the public. This plan was attempted to be carried into effect at Danzig, and in some smaller provincial towns; but it was soon found totally impracticable. The impossibility of watching, controlling, and maintaining, at the public expense, the great number of persons of the middle and lower ranks thus imprisoned and prevented from gaining their livelihood, and the temporary difficulties, and even final ruin, of many families whose social and commercial connexions were suddenly interrupted, soon created a loud expression of public opinion against this system, the more so as it was found absolutely necessary to admit to the imprisoned houses a variety of exempted persons, such as medical men, clergymen, and even lawyers and police officers, whose intercourse frustrated the intended end; and as the complicated scheme of a communication by means of intermediate agents, to be established on neutral ground, could only be accomplished in theory and on paper. It was also objected, that healthy persons, shut up in houses tainted by the effluvia of cholera, and under circumstances not unfavourable to the health of body and mind, were in this manner exposed to the disease in an unwarrantable manner; and when, in a house subjected to this measure, a second and third case of cholera happens, the non-contagionists ascribed it, not to the action of the effluvia, but to the bad food, want of exercise, and depression of the mind caused by the long imprisonment. The period of sequestration of houses was, like the quarantine for those who had left infected districts, successively diminished to ten and five days, and the whole plan ultimately given up. And I am very sure, that whoever has once witnessed an attempt to establish the separation of a house in the manner alluded to, must immediately perceive that it cannot be effectually and consistently done without a military or police force, as well as an expense totally out of proportion to the importance of the object intended.

It being found difficult to confine in their own habitations those persons who are supposed to have been under the influence of the contagion, it was next proposed to remove them to other buildings established for that purpose, *internal quarantines*. Thus the double advantage was gained, of placing

these persons out of the sphere of the continued action of the effluvia, of providing for their wants where it was necessary, of constantly observing their state of health, and having immediately recourse to the proper treatment when symptoms of the disease showed themselves,—and at the same time of preventing their communication with other persons, and the risk of infection through their medium. I have reason to believe that the measure alluded to has proved useful in all these respects. It is certainly of importance to remove from the action of the cholera effluvium those who have been for some time exposed to it, under the influence, not only of the same concomitant causes, which have acted upon the person first attacked, whether it be cold, want of proper food, or other misery, but frequently with the additional disadvantage of a mind depressed by the illness of their relatives. Sometimes children are thus deprived of their parents, wives of their husbands, and a great benefit is conferred upon them by taking them away from the scene of their losses, and allowing them to restore their body and mind in a healthy, airy building, where their wants are kindly attended to. There have been more than twenty instances here in Berlin of persons placed in these quarantines having, on the third or fourth day, been attacked with cholera*; and there is no doubt that their chances of recovery were rendered much more favourable by their having been under medical observation, and by the necessary measures for their cure being immediately resorted to.

The removal of *all* persons who have been exposed to the effluvia of cholera into quarantine establishments will not be practicable anywhere, and least of all, in Great Britain. Still I would strongly urge the propriety of having institutions of this kind arranged in every town where an irruption of cholera is anticipated; they are, indeed, a great advantage to the poorer classes, and a considerable source of security for the public. It ought to be left to the discretion of the local committees of health, as well as to the choice of the persons concerned, whether they will take the benefit of a temporary residence in quarantine or not.

Admitting the possibility of transmission through the medium of a third person, a great difficulty arises from the necessary intercourse of medical men, and other attendants, with

* I know of one case, where one member of a family having died of cholera, the rest of the family, consisting of father and three children, were removed to quarantine, and continued apparently well till the day preceding that on which they were to be dismissed (the fifth), on that day they all of them took cholera, but being immediately removed to an hospital, they all recovered.

cholera patients, and the danger of their infecting other persons. It being, from the beginning, found impossible to include medical men and clergymen in the general measures of sequestration, which were originally thought necessary, peculiar precautions were recommended to these individuals, by which it was thought that all danger would be avoided. They were to protect themselves and others by wax cloth gowns, gloves of oiled silk, as well as repeated washings, exposure to chlorine gas, or nitrous acid vapour*, and frequent change of dress. The appearance of the above costume, in which a few medical men and the servants of some of the local committees originally showed themselves, was so awful, and at the same time ludicrous, that it was by general consent tacitly given up. And it being soon observed that scarcely any medical men took the disease, except the assistants in the hospitals, and no cases of transmission of cholera by them to other persons being publicly noticed, the exaggerated anxiety in this respect gave way to a complete security; and at this moment scarcely any precautions are taken by the great majority of those whom their business leads to intercourse with the sick. It is evident, however, that if the disease has ever been transmitted by a medical man to his patients, or other persons, he alone can be supposed to be fully aware of the circumstances of the fact; and, certainly, no man will be anxious to prove, either to himself or to others, that he is the cause (however innocent) of serious misfortune to a fellow-creature. Of the frequent transmission of cholera by *hospital attendants*, and by the *porters* and *servants* of the cholera committee in Berlin, I have very sufficient evidence, and I have in the former part of this letter mentioned several instances of this description. It appears to me, therefore, that security in this respect ought not to go too far. I think that it is a sacred duty of every medical man, whom necessity or scientific zeal leads to intercourse with cholera patients, at least in every instance when he may suppose his body or clothes to be impregnated with the effluvia of the disease, to observe some caution in his subsequent communication with other persons, particularly with those whom he may consider as at all predisposed to the deleterious action of the contagion. All other persons employed in cholera hospitals, or in attending cholera patients in town, all the servants of the cholera committees, should be under some control; they ought to be obliged, on the one

* 'To be continued for at least a quarter of an hour,' according to a preliminary regulation issued for Berlin, which, however, has never been carried into effect.

hand, to avoid all unnecessary intercourse with the public, and on the other, endeavour by cleanliness, frequent washing, bathing, and change of dress, to make their persons less likely to be bearers of contagion.

4. We have now seen how difficult it is, under all circumstances, to put a stop to human intercourse, and consequently to prevent the transmission of the cholera effluvia from one house or person to another. This transmission is undoubtedly checked in a far more efficacious manner, *if the contagion can be destroyed* wherever it has been generated. I need not enter into any details on this subject, as the measures calculated to destroy the effluvia of cholera seem to be precisely the same as those which have for many years been generally and very successfully employed against the effluvia of *typhus*, viz., ventilation, fumigations, washing, scrubbing, and white-washing of the houses or dwellings. I am not aware that experience has sanctioned any difference in the disposition of the effluvia of typhus and cholera to be rendered innocuous by the agency of water and air.

You will, no doubt, have learned, that since the appearance of cholera in Russia, much confidence has been placed in the supposed 'disinfecting' power of chlorine and its compounds. The purification of houses, utensils, goods, and men, by means of chlorine gas, chloride of lime, chlorine water, chlorine soap, &c., has been recommended and insisted upon in the regulations successively published by the Russian, Polish, and Prussian governments: immense quantities of these substances have been consumed; but as far as my knowledge goes, there is no fact on record which establishes any peculiar efficacy of chlorine in the destruction of the contagion of cholera. The decomposing effect of chlorine, in a concentrated form, upon dead animal substances, is indeed a well known-fact; nor can we doubt its destructive influence upon vegetable and animal life. But it must appear very improbable that it can exert any peculiar agency on the effluvia of cholera attached either to living beings or to dead substances, without proving destructive to the former, and also injurious to the latter. I must consider the process of 'disinfection,' which has been adopted here with all persons and things supposed to be tainted with the effluvia, and to which particularly the medical attendants had to submit, as almost nugatory; and certainly, the mere exposure to a draught of free air must be admitted to be more efficacious in purifying a person who has been exposed to contagion, than his being shut up for five, ten, or even fifteen minutes in an atmosphere impregnated with the deleterious chlorine gas. These considerations have also very

recently led the public authorities to let all chlorine disinfections cease, as far as they were officially carried on. There can be no objection to adding chlorine or nitrous acid vapours to the other means employed to purify the empty rooms in which cholera has occurred; but we, who have suffered from the injurious influence of these substances when engaged in attending or visiting cholera patients and hospitals, must decidedly object to their being employed wherever there are human beings, patients or healthy persons, at the same time exposed to their action.

5. In addition to the measures now mentioned, it has generally been found advisable to take some precautions with regard to the *funerals* of the bodies of those who have died of cholera. Repeated experience has shown that the manipulations connected with the preparation of the dead bodies for the funeral, and still more the assemblies of friends and others in the habitations of the dead, have frequently led to a propagation of cholera. The Prussian government accordingly was led, in its original regulations, to direct the funerals of persons dead of cholera to take place at *night, unaccompanied* by any followers, and to proceed to a *separate burying ground*, far removed from human habitations.

Some precautions are undoubtedly necessary in conducting the funerals of those who have died of cholera. There appears, however, to be no good ground whatever for insisting on a separate burying-ground; for it is evident, that the bodies, when once coffined, and still more when covered by the earth, must cease to be an object of apprehension, and that they can, least of all, be supposed to prove injurious to the common habitations of the dead. No measure connected with the cholera was so odious to all classes of the community as these separate burying-grounds, for nobody would be familiarised with the idea of being interred at a distance from the bodies of his relations and friends, even although the cholera burying-ground was hallowed according to the rites of the church.

But whilst I can see no objection to the dead being carried to the common burying-grounds, I should strongly advise against admitting any congregation of persons to the house in which a death from cholera has occurred; and I think the civic authorities ought, by every means, to prevent similar assemblies. The funerals should take place as soon as possible after death; for it is of great importance to be able immediately to proceed to purifying the house, which cannot be done till the body is removed: the persons who wash and dress the bodies ought to be made aware of the risk they incur, and be warned against any concomitant exposure to the common

causes of disease ; and if any friends and relations wish to accompany the hearse, they ought to assemble in some other place, and follow the body at some distance.

III. It now remains to me shortly to notice what every individual *can do*, and *ought to do*, in order to prevent an attack of cholera. In this country, it has been found extremely difficult to adhere to a just medium of caution, and whilst a great part of the population of the lowest classes took no precautions whatever, many of the middle and higher classes of society went beyond all moderation in the extent of their preventive measures. Upon the whole, however, I do not hesitate to express my conviction, that the very general diffusion of knowledge in this country, by means of which the attention of the great majority of our population has been called to this subject, is to be regarded as one of the main causes of the unprecedented small extension of cholera, particularly in Berlin, where, on the 60th day of the irruption of the disease, only five of one thousand, or *one-half per cent.* of the population had died of the disease.

The protecting measures which everybody may take for himself and for his family, have a double object, viz., avoiding *contagion*, on the one, and the *predisposition to the disease* on the other, hand.

In Germany, the alarm excited by the approach of cholera was so great, among the educated class of society, at least, that very many persons changed their whole manner of living for weeks and months *before* the disease even reached their place of residence. It is evident that this is a very supererogatory measure, and that no person needs to reflect on the possibility of his taking the disease before the contagion has reached his place of abode or its vicinity.

The advice to be given with regard to *avoiding contagion* is very simple. *Those whom no duty (self-imposed or not) calls to have intercourse with the sick*, will do best not to expose themselves negligently, or from motives of idle curiosity, to the effluvia of cholera in the habitations of the patients, or even to unnecessary communication with those who may be considered as probable bearers of contagion. When the cholera has been imported into a particular district of a town, or by a particular class of persons, sailors, shippers, pedlars, soldiers, it is advisable not to frequent such districts and persons. The heads of families will act prudently when, during a general prevalence of cholera in a town, they see that those who are under their charge, particularly children and domestics, abstain from visiting places where they may meet crowds

of the lower classes, and still more, from going into houses likely to be tainted with the effluvia: they will also not carelessly receive into their houses, as domestics, working people, or even as transitory guests, persons who cannot prove themselves to be in good health, and to come from sound districts.

Those whom duty or scientific zeal leads to expose themselves to the effluvia of cholera, ought, nevertheless, to avoid as much as possible these effluvia in *close* and *confined situations*. The sick rooms in private houses, and in hospitals, ought, for the benefit of those who attend the patients, to be always kept in an airy and ventilated state. I have insisted upon this principle since the first cholera cases have happened in Berlin. It was generally objected to me, that the safety of the patients must be paramount to any considerations regarding the attendants, and that the patients requiring the administration of external heat, the windows of the room cannot be kept open in cool weather. But even this objection must now cease—a cooling treatment having been found not only safe to the patients, but generally preferable to the elevated temperature which had so long been thought necessary.

It ought also to be attended to, that medical men, attendants, nurses, and, in short, all those who are to expose themselves to the contagion of cholera, do so *only whilst they are in good health*, and cease their functions whenever they feel indisposed, either from the fatigue of the service, or from the influence of other morbid causes. An imprudent perseverance in attending the sick whilst labouring under disease or excessive fatigue, has too often been attended with serious, and sometimes fatal results.

An excessive anxiety, and a confused notion that the efficient cause of cholera is *floating in the air*, (a notion derived from the arguments of the supporters of an epidemic influence,) has, at the first appearance of cholera, led to some very absurd and ludicrous practices, adopted by some, in order to 'disinfect' the atmosphere surrounding them. The favourite disinfecting agent, chlorine, was administered not only to purify dwellings, goods, and persons who had been exposed to the effluvia, but even the houses of the healthy were impregnated with this substance; and there were those, whose *mind* did not feel at *ease*, unless they felt their chest moderately *oppressed* by its deleterious action*. Others were taught to place confidence in

* A letter from a Russian physician to his friends in Germany (Allgemeine Zeitung, 1830, No. 244.), recommends: 1. one pound of chloride of lime dissolved in ten pounds of water to be placed in an open dish in the room where one lives: 2. half an ounce of chloride of lime in powder to be put into paper then packed into cotton, and sewed into a

tar vapour, it being reported that the inhabitants of the rope-manufactories in St. Petersburg had remained free of cholera ; and some preferred to have the refuse of the coal gas manufactures standing on their house floor, and emitting its disagreeable odour.

The least disagreeable of these prophylactics, and that which has been most generally employed in Berlin, was the *vapour of vinegar*, some of that substance (usually with *cloves*) being placed over a lamp, and allowed slowly to evaporate. It is unnecessary to observe, that even on the erroneous supposition of a universal infection of the atmosphere by a deleterious miasma, the addition of chlorine gas, tar, or vinegar vapour cannot be supposed to *improve* the air : and that, contagion being admitted as the sole efficient cause of cholera, these prophylactics can be of no use, and are very superfluous where no effluvia of cholera are known to exist. They were all of them resorted to at a time when a general fear and excitement prevailed among the public as to the danger to be apprehended from cholera ; but they have now gradually disappeared in the houses even of those who were foremost in their preventive zeal. I sincerely hope that, in Britain, you will begin as we have ended, and not again go through a succession of exaggerated notions and of superfluous measures, calculated only to increase public anxiety, and unnecessarily to call everybody's attention to this subject of general apprehension.

I have now some remarks to make on the means of *diminishing or preventing a predisposition* to cholera. These means plainly consist in endeavouring to keep in good health, and to avoid, not only serious illness, such as would be considered as important at any time, but even those slight indispositions which are not usually regarded as deserving of attention, but which at a time, and in a place where cholera prevails, may prove very dangerous, by rendering the economy susceptible to the action of the efficient cause of the disease. Of course, *the common rules of diet and regimen are applicable and sufficient in this respect*. I have only to advert to some features of the cholera regimen which have attracted peculiar notice.

bag. One of these little bags is to be carried in every pocket of the coat, waistcoat, and trowsers : on going out of the house, one of them must be held constantly in the hand ; on opening a door, the bag is to touch the latch ; every piece of money, every letter or paper received, is to be rubbed with it, and placed beside it in a pocket ; and where it is necessary to breathe an impure atmosphere, the said bag is to be held before the mouth. A chemist, at Moscow, recommends even the beef and green peas, before being prepared for dinner, to be boiled in a weak solution of chlorine.—*Bon appetit !*

It having been ascertained that *cold* frequently acts as a concomitant cause of cholera, warm dress was particularly recommended. The Polish government, during the prevalence of cholera in its army, furnished to the soldiers *flannel belts*, to wear under their shirt, in order to keep the abdomen warm. This article of dress has been very generally adopted in this country also: I believe it has for some months been almost universally worn by the higher and middle ranks of society in Berlin.

The same purpose, that of preventing the action of external cold on the stomach, seems to have been intended by covering the epigastrium with a very large *pitch-plaster*, spread upon thick leather. This prophylactic, also, commonly called 'the Princess Lobkovit's Plaster,' having been first employed in Galicia, and strongly recommended by that lady, has found numerous advocates among high and low personages, some of whom, however, have soon perceived the truth of the general principle, that '*non omnes omnia possumus*;' for whilst some wore the plaster for weeks and months, others, particularly delicate ladies, were cruelly blistered by it on the first night of its application. Some of our medical men, who act on the principle of courting the prejudices of the public, have wisely thought of improving this plaster by adding some medicated ingredients, such as camphor and *quinine*: it is evident, however, that the plaster chiefly, if not exclusively, acts by excluding cold; and that this object may be attained as perfectly, more safely, and certainly with greater attention to comfort and cleanliness by the flannel-belt.

The *diet* to be used during the prevalence of cholera has also been a subject of discussion and apprehension. In all countries in which the cholera has prevailed, some peculiar articles of food have incurred the odium of being the principal cause of cholera: in Bengal, it was the *rice* of the country; in Mauritius, the *rice from Madagascar*, which accordingly was cautiously abstained from, and the *Bengal rice* employed instead; at Mascate, the Hindoos believed the Mahometans to take the cholera because they ate *cow's meat*; in Russia, cucumbers were blamed; and in this country, *fruit*, as well as fish, and even *fowl*, have become objects of apprehension: the former, on account of the tendency to diarrhoea which it sometimes occasions; the latter, from the popular belief that these animals also were under the influence of 'the miasma.' The Berlin physicians had the difficult task imposed upon them, of stating to the families entrusted to their medical care, not only every single article of food which was to be admitted, but even the safest mode of preparation; and the

greater the apprehensions of the public were, the more necessary it appeared to avoid the charge of negligence by attending to all the minutæ of dietetic distinctions. The choice of the safest articles of drink was also discussed; at one time, many medical men declared themselves against the use of beer, particularly a kind of small beer, the favourite beverage of the Berliners, to the great dismay of the brewers, who, in their turn, brought forward certificates from other physicians, 'that beer is good, and very good.' Even innocent cold water was prohibited; it was to be boiled, or mixed with sugar, salop, or red wine. White wine also did not pass the ordeal; everybody took to claret, and in greater quantities than formerly.

I have already alluded to the effects of this revolution in the manner of living among those who had time and money enough to follow the fashion. A great number of persons who 'had never known where the stomach lies,' now felt uncomfortable, particularly from a tendency to constipation and excitement produced by a free use of wine. Their attention was more and more directed to their digestive organs; their apprehensions increased; and thus an artificial 'epidemic constitution' was brought on, which, no doubt, will figure in several of the forthcoming accounts of the Berlin epidemic.

The fashion alluded to, however, as all fashions will do, is now abating, and every body is returning to his usual mode of living. It is to be hoped, however, that the principle which originally led to these exaggerations, that of strict *temperance* and *frugality*, wherever the proximity of cholera is apprehended, will not be neglected in future. For it is not so much the use of any particular article of food, as every excess in eating and drinking, which seems to bring on a state of the digestive organs, predisposing to an attack of cholera.

Besides these and other rules in diet and regimen, numerous, more or less *specific*, *preservatives* have been recommended. In Danzig a cobbler attained great celebrity by some drops he prepared according to a secret prescription which he pretended to have learned during a residence in India; in Königsberg red wine with English mustard was generally used, not without proving injurious in many cases; in Vienna one or two drops of volatile oil of chamomile, taken every day, was regarded as a certain preventive; and at Berlin any remedy required only to be put into the newspaper in order to be found and bought in all the shops next day. Some wore a linen bag with camphor on the pit of the stomach, and others recommended the keeping open of blisters, issues, and sores, the running from which was to ensure against an attack of the disease. Some medical men, on the groundless hypothesis that cho-

lera is a kind of intermittent fever, dosed every body, even persons in the most perfect state of health, with quinine. There were cholera-lozenges, cholera-cakes, cholera-sweets, and cholera-drops; and even the lowest class of labourers, not being able to indulge in all the complicated prophylactics of the wealthy, comforted themselves with a daily portion of *cholera-brandy* *. I need not advert to the absurdity of all special measures of this kind, which are superfluous when diet and regimen are otherwise well attended to, and totally insufficient when that is not the case.

I have still some facts to add, which will show how much may be gained by a due attention to avoiding the causes of cholera, and how the occurrence of disease, at particular times and at particular places, is dependent on circumstances which may be controlled.

I. In Poland and Gallicia the cholera has found its most numerous victims among the Jewish population, whose habits of frequent intercourse with strangers, small habitations, scanty food, and total want of cleanliness, contributed to render them peculiarly susceptible. When the disease approached the town of Posen, the population of which consists of 25,000 inhabitants, 5000 of whom are Jews, the Rabbi, or priest of the latter persuasion, strongly represented to his flock the importance of their avoiding the causes of cholera; he stated to them the necessary steps for this purpose as a religious duty, and endeavoured to find in the Talmud divers precedents for the present circumstances. On this occasion their religious obedience, allied by the fear of death so peculiar to this nation, prevailed over their habits, and the Jewish community preserved itself free from cholera in a very singular manner, there being only thirty-seven deaths among the Jews, whilst the total mortality from cholera amounted to five hundred and

* The general anxiety which prevailed before the public was familiarized with this new disease, was occasionally relieved by some ludicrous incidents which never failed to be talked of. One of our *eckenstebers* (the lazzaroni of Berlin) asked in a shop for brandy, stating that he wished 'a groschen's worth of *Cholera* and half a groschen's worth of *Morbus*.' A journeyman tailor, not too fond of work, succeeded in getting himself four or five times carried into *different* cholera hospitals, on the pretence of having the disease; in each of them it was soon discovered that he was not seriously ill, but each time he had, according to the existing regulations, to pass five days in quarantine, where he was comfortably lodged and well fed; he was at last discovered by some thefts he committed during these clinical pursuits. Other persons extorted money, by appearing under some pretence before those who were most afraid of contagion, and stating themselves to be just coming from a house infected with cholera, when their wishes were promptly satisfied in order to get rid of their alarming presence.

forty-one. In Berlin there have been only *two* deaths from cholera among the Jewish population, amounting to about seven thousand.

2. The military force also has usually suffered severely from cholera, a phenomenon easily explained by their somewhat irregular mode of living, the troublesome service, and the frequent exposure of soldiers. In Berlin, however, there have been only thirty-four cases of cholera (seventeen deaths and seventeen recoveries) among the military, who at the time of the prevalence of the disease amounted to about nine thousand men. This favourable result seems to be owing in a great measure to the excellent preventive measures taken when the cholera appeared. All unnecessary service, fatigue in drilling, &c., was suspended; every man was obliged to be in his barracks before seven o'clock in the evening; they were all made to pass review repeatedly in the course of the day; they received a very considerable increase of pay, by which they were enabled to defray the expense of a warm supper; and, in addition, every man had a moderate portion of bitter brandy given to him every morning. Every fault in diet, such as eating raw fruit, was strictly controlled and severely punished. The usual dress of the soldiers, which is warm and comfortable, was still improved by a broad flannel belt to be worn round the body. When a soldier was taken ill of cholera he was immediately removed to a military hospital (of which *five* had been prepared in different parts of the town), and the other men who inhabited the same room with him, taken to quarantine*.

3. Whilst the influence of the weather upon the increase and decrease of cholera has been doubtful and uncertain, the amount of sickness has evidently been influenced by events and periods, which produce a more general exposure to the concomitant causes, as well as to the contagion of cholera.

In St. Petersburg a great increase in the number of cholera cases was remarked immediately after the festival of Pentecost, when the Russian population is accustomed to indulge in excesses of all kinds.

In Berlin the number of cholera cases reported on *Tuesdays* and *Wednesdays* has almost constantly been greater than that of the other days of the week: a fact which is easily explained when it is remembered that the lower classes of the population are on *Sundays* more than on other days disposed to meet,

* Nevertheless it once happened that one man having been attacked, and removed, another in the same room took ill immediately afterwards, and two more were seized with cholera in quarantine.

and to commit excesses in diet, which are on the third or fourth day followed by cholera.

The unprecedented number of sixty-six cases of cholera was reported on the 5th of October, and it has never been so high again in Berlin. This is the third day after the term of 'fitting,' when families change not only their *houses* but their *domestics* also, and when the streets and houses are crowded with persons who in one way or other are connected with these operations. Some may be disposed to ascribe this coincidence to the cold and damp habitations which many persons had to enter for the first time; others to the greater chances of contagion. I think the operation of both causes probable, but the fact is curious.

I have now, my dear Sir, to terminate this letter on the causes and prevention of cholera, which has grown longer and more detailed than I anticipated in commencing it. I wished, however, particularly in the investigation of the causes, to put you as far as possible in possession of all the facts on which my view of this subject is founded, the more so as I anticipate that the contagion of cholera will meet with as decided opposition in Britain as it has experienced from a large proportion of medical men in this country.

I hope that you will excuse some of the imperfections of this paper, by my desire not to lose a day in putting you in possession of the intelligence it contains, at the moment when it may prove most interesting to you. I should feel happy, indeed, if, in perusing its pages, you were to discover in them any traces of that patient, firm, and unprejudiced mode of investigation, that prudent caution in arriving at positive conclusions, and that modest reserve in expressing a personal opinion, which has uniformly distinguished your writings as well as your lectures, and which I have constantly endeavoured to imitate, since the happy time when your paternal kindness admitted me to be an inmate of your house and a companion of your studies.

It has given me great satisfaction to hear that your eminent labours in the advancement of medical science have at last met with a fit public acknowledgment; and that the school, of which for many years you have been the brightest ornament, has now the honour of seeing you placed in a station which has long since been due to your merits. Believe me that no distance of time or place will ever diminish the grateful feelings and the sincere attachment, with which I am,

My dear Sir,

Your faithful pupil,

J. W. BECKER.



